Aalto University

Ceramics and its Dimensions: Shaping the Future

Edited by Maarit Mäkelä

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This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
Creative Europe Programme
of the European Union

Aalto University Publication series
ART+DESIGN+ARCHITECTURE 4/2016
Aalto University School of Arts, Design and Architecture
Helsinki, Finland
books.aalto.fi

This publication accompanies the touring exhibition *Ceramics and its Dimensions: Shaping the Future,* on view for the first time from November 10 through December 7, 2016, in the Fiskars Copper Smithy, Finland.

Editor in chief Maarit Mäkelä
Editorial team Barbara Schmidt, Priska Falin and Minerva Juolahti
Graphic design Benjamin Blazy, Toni Brell, Maximilian König, Simon Melchers and Ann Christin Sievers / Supported by Steffen Schuhmann
Layout and typeset Toni Brell / Supported by Steffen Schuhmann
Language revision Damon Tringham
Cover photo by Chikako Harada: Picture of Priska Falin's work Moving on – Leaving behind, an installation from broken porcelain pieces and a video projection (see p. 208–209)
Printed by DZA Druckerei zu Altenburg, Altenburg, Germany
Exhibition Curator Riikka Latva-Somppi
Exhibition Architecture Kolja Vennewald / Supported by Barbara Schmidt

ISBN 978-952-60-7042-1 (printed)
ISBN 978-952-60-7041-4 (pdf)
ISSN-L 1799-4853
ISSN 1799-4853 (printed)
ISSN 1799-4861 (pdf)

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Ceramics and its Dimensions: Shaping the Future –
exhibition Information of the touring exhibition

Fiskars Village, Finland
Copper Smithy, White Hall
Exhibition open: 10th Nov–7th Dec 2016
More info: www.fiskarsvillage.fi/en/see_and_do/exhibitions
Email: fiskarsvillageinfo@fiskars.com

Selb, Germany
Porzellanikon – Staatliches Museum für Porzellain
Exhibition open: 21th Jan–26th March 2017
More info: www.porzellanikon.org
Email: info@porzellanikon.org

Belfast, Northern Ireland
University of Ulster
Exhibition open: During 2017
More info: www.riad.ulster.ac.uk
Email: Michael Moore m.moore@ulster.ac.uk

Stoke-on-Trent, United Kingdom
British Ceramics Biennial
Staffordshire University
Exhibition open: During 2017
More info: www.britishceramicsbiennial.com
Email: info@britishceramicsbiennial.com

Berlin, Germany
Bröhan-Museum
Landesmuseum für Jugendstil, Art Deco und Funktionalismus
Exhibition open: 20th Jan–18th April 2018
More info: www.broehan-museum.de
Email: info@broehan-museum.de

Ljubljana, Slovenia
National Museum of Slovenia – Presernova
Exhibition open: 15th May–31st July 2018
More info: www.nms.si
Email: info@nms.si

Prague, Czech Republic
Museum of Decorative Arts in Prague
Exhibition open: During 2018
More info: www.upm.cz
Email: info@upm.cz

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Foreword & Introduction

Wilhelm Siemen **Foreword: Ceramics and its Dimensions**

Ceramics is a natural product. The raw materials, such as clay, kaolin sand, feldspar, quartz and other minerals, are taken from the ground. People have known this for thousands and thousands of years, and they have taken advantage of the special characteristics of ceramics as a material: that is, its persistence, loading capacity, waterproofness and chemical and bacterial resistance. Throughout history, ceramics has played an important role in the development of different kind of societies all around the world, influencing the way people have built their houses, lived their lives and eaten their food.

The European project *Ceramics and its Dimensions* seeks to be a part of the rediscovering of the role of ceramics and the bringing forth of the knowledge of the heritage and the different traditions of the use of ceramics. This ambitious project has connected museums, architects, designers, industry and stakeholders from different European countries to explore ceramics according to its cultural, historical, technical and artistic aspects. The project is supported by the EU Programme *Creative Europe,* and it brings together twenty-five partner institutions from eleven European countries: research institutes that are exploring for the new ceramic materials and new ways to use the already known materials; factories that provide a platform for realising the objects that the new generation of designers have in mind; museums that on the one hand preserve the knowledge of our heritage and on the other hand support our evolving contemporary culture by presenting their collection items as a source for inspiration; and universities that educate visionary actors in the field of art and design who have the capacity and passion to grasp the complex challenges that the twenty-first century entails.

Within the project, there are ten separate modules that focus on diverse aspects of ceramics. Each of the modules uses their own way to explore, discuss, show and share their specific topics. For example, the module *European Cultural Lifestyle in Ceramics – from Baroque until today* constitutes a touring exhibition that presents some carefully selected items which mirror the history of ceramics in the European lifestyle from the Baroque period

to the present. Then the module *Architectural Ceramics in Europe* uses the form of a database to present some extraordinary buildings in European history. It highlights the fact that ceramics is not an insignificant building material but in fact one which has in many cases improved the quality of architecture significantly. The module *Prop ceramics – ceramics in movies and advertisements* takes a retrospective view of the socio-cultural background of the use of ceramics in films.

On the other hand the module *Ceramics – what it means to me* brings us to the question of how to use ceramics for improving the living conditions of people and how to make sure that ceramic products are sustainable. It also tackles the fundamental question of how we can create ceramic pieces that are produced in large quantities yet at the same time feel personal. To support the challenges for the upcoming generation, the *Future Lights* module and competition is targeted at young designers who have just started their careers. The module provides a chance for the selected participants to promote their career as designers and ceramicists. Another module in which the new generation of artists and designers are provided an opportunity to explore the future through ceramic material concretely is *Shaping the Future – Ceramic Development and Tomorrow's Design.* Right now, you are handling the publication that will discuss and show in detail how the module is in fact shaping the very future!

Wilhelm Siemen
Director Porzellanikon Staatliches Museum für Porzellan, Selb, Germany, Head Ceramics and its Dimensions *project*

Maarit Mäkelä, Tapio Yli-Viikari and Riikka Latva-Somppi **Introduction: Shaping the Future**

European ceramics traditions and cultures are facing similar challenges across the entire continent, many of them in one way or another linked to the recent development of digital technology. This development is changing the rules of our everyday life as well as all aspects of trade: our expectation that everything should be accessible NOW impacts upon our priorities and tests even the idea of our cultural heritage. When considering the recent historical context of ceramics in Europe, the most significant crisis of the traditional industries emerged when famous European brands began closing down production in their original factories. Often, neither superior technology nor mastery of materials has helped factories retain production in the original venues. As a result, we have seen production move to locations with cheaper labour. New global strategies do not see owning the technology and manufacturing as an advantage but instead value the ability to quickly respond to changes in the global free markets. Instead of investing in technology and production, companies are currently investing in brand development and marketing. Changes in markets, technology and logistics are also challenging, and thus transforming the education and training of new designers.

The new possibilities now available through digital technology are opening completely new ways to use material. Logistics and methodologies that enable us to control the different processes make it possible to fabricate, instead of thousands of the same, variations on demand and to locate the production near the customer. Products may be delivered digitally and printed on demand near the user and by the user. In this situation, 3D printing and the discourse around it has provided new ways of thinking about the business of the future.

The EU project *Ceramics and its Dimensions* is composed of ten modules. Each of these modules approaches the theme of ceramics from a different perspective. This publication shares, shows and discusses the ideas, experiments and processes, as well as the final outcomes of these processes, that have evolved during the project around the module *Shaping the Future – Development and*

Tomorrow's Design. The module is conducted by the Aalto University, School of Arts, Design and Architecture, Helsinki and is implemented in collaboration with the Kunsthochschule Berlin Weißensee and the University of Ulster, Belfast. In addition, the module is collaborating with The Royal Danish Academy of Fine Arts, Copenhagen, Denmark.

The module began with a one-week workshop that took place on the premises of our associated partner, the KAHLA Porcelain factory in Germany. This experimental workshop gathered together students, teachers and other stakeholders from the four partner universities with the aim of exploring the material of ceramics and the associated new technologies from a wide range of perspectives. Thus, the workshop constituted a shared educational platform for four international universities, on which ideas were shared, discussed and nurtured further. During the workshop, the participants explored new techniques, experimented and developed their personal ideas further by using the tools, materials, techniques and processes available at the factory. In addition, four ceramic 3D printers were brought to KAHLA from three schools. Being similar in construction – delta printers – they were operating on different hardware and software and thus allowed different kinds of interaction: some were executing G-code, generated automatically by slicer software from digital 3D models, some were running on individually written code, and some were set so that spontaneous interaction between machine, material and maker was possible.

These experiments resulted in diverse new ceramic pieces, yet even more important were the shared experiences and ideas that led to creative processes that continued after the workshop had finished. This publication seeks to share, via images and texts, the thematic content and spirit of the workshop, and to show where the creative processes that started during the workshop have led. The articles of the publication discuss the main issues of the workshop that were design, education, 3D printing and food. The aim is to challenge, and perhaps even reposition, the role of ceramics and its future. For at least the past three decades there

has been much discussion on new technologies and applications in ceramics. New inventions have been made in bioceramics and nanotechnology, yet, when we think of ceramics, an idea of a pot emerges. Ceramics is a material most suitable for fulfilling one of our primal needs – it can constitute a vessel to eat from. Eating is a very intimate act, one which forms a relationship between a human and a material, and it also includes all of our senses. From this intimacy, the vessels used for eating grow into objects of great societal value, status and individualistic expression.

If previously one of the most evident relationships between food and design was presented in the form of tableware, today the notion of food design also entails many other material and immaterial processes. In the workshop, the relationship between food and ceramics was explored from a multiplicity of perspectives. With the guidance of the *dilettantin produktionsbüro,* represented at KAHLA by the chef Björn Hille and the artist Anneli Käsmayer, the workshop participants not only gathered natural food from the surrounding countryside, but also prepared it and designed a shared eating experiment in which the food was served from ceramic vessels that they had designed and made themselves. The experiment also brought out other food-related discourse topics, such as what constitutes sustainable food, and how and where food should be produced. One evening, a long dining table also provided an aesthetic and socially engaging eating experience that was shared with all the participants. Food is in many ways an essential part of design. In this publication, food designer and researcher Francesca Zampollo shares with the readers the conversation that took place between Zompollo, Barbara Schmidt and Nathalie Lahdenmäki. Both Schmidt and Lahdenmäki are ceramicists and interested in designing for food – both of them also participated in the KAHLA workshop as facilitators and educators.

The economic and technological changes described above have recently been rapid, and they have also posed challenges and changed the values of everyday life. In his article, Dirk Hoyer discusses the concept of crisis as one of the most common terms

used in the current political, economic and cultural mindscape. One of Hoyer's key questions is whether we, instead of limiting ourselves to criticism of the existing facts, can find the possibilities that they open? The real task is not to keep up with the transformation of the market and technology, but to believe in utopias and in our ability to make changes. Hoyer challenges us to radically use our imagination and to make it a common cause to build *»solidarity across boundaries and borders, real or imagined, with the explicit intention of undermining the existing power structures«.* Radical imagination also suggests drawing on the past. This viewpoint is further developed in Michael Moore's article, in which he discusses the value of interaction by offering us a view of the development of collaboration between ceramic art and industry.

Digital manufacturing also has the potential to shift power from industrial mass-producers to the entrepreneur-designer and the consumer[1], thus bringing us back to a revised version of the pre-industrial craft economy. As with any new toy, we are still experimenting with what to do with digital tools. The world has become smaller through different social platforms and the possibility of individuals gathering with others of like-mind – today, making an impact through joint action is easily possible. An object is less likely to change the world, but at present there is a true possibility to shape the future through action.

In a lecture during the KAHLA workshop, Dries Verbruggen[2] referred to 3D printing as nothing new, but simply as computer-controlled coiling: *»3D printing is not high tech. It is just a continuation in the tradition of making.«* However, new digital manufacturing methods may have a remarkable impact on the larger picture. It is not the technique itself but the aftermath that is creating the big change. It is easily noted that the technique is more suitable for specific forms, surfaces and patterns. Will it start to dictate what we search for, or can we see the possibilities for new material aesthetics? Furthermore, can we adapt our material knowledge to the potential of the new technologies?

1 **Verbruggen, Dries & Warnier, Claire** (2015). *Back to the Future, How tradition inspires contemporary making.* In Mateo Kries and Jolanthe Kugler (eds.) The Bauhaus: #itsalldesign. Weil am Rhein: Vitra Design Museum, p. 427
2 **Verbruggen, Dries** (2016). *Lecture on April 5th in KAHLA Porcelain factory,* Kahla, Germany

The 3D printing technique in ceramics is developing very rapidly, and in this project we have only taken the introductory steps. In their article, Flemming Tvede Hansen and Priska Falin, who both participated in the KAHLA workshop as educators and facilitators, discuss what the future development of this area might bring to this still unknown territory. Our intention during the project is to investigate the rapid development of this area and bring examples of the latest new developments to the touring exhibition. This is a significant endeavour, as during the time period between 2016 and 2018, the exhibition will travel through seven different places. In addition to the first exhibition held in Fiskars village, Finland at the end of 2016, the exhibition will tour to Selb, Belfast, Stoke-on-Trent, Berlin, Ljubljana and Prague. The intention is that in certain places, for example in Stoke-on-Trent, the content of the exhibition will be supplemented with updated technological innovations and related experiments.

The focus of the *Shaping the Future* module is not to develop 3D printing technologies in the field of ceramics per se, but instead to test, stretch and understand the possibilities and consequences that this technology entails. This is also the starting point of the closing article of this publication, written by Jörg Petruschat. In his article, he considers what the link between human beings and the objects we create and use might be. He proposes that there is a kind of resonance that, through the object, actually links the maker or designer of the object to the one who ends up using it.

An essential question related to our project is: How will digitalisation change our aesthetical values? That is, how we see the visual information that is rapidly changing around us. This change is also influencing our other senses. Danish curator Henrik Most[3] talks about humans as creatures of the caress of five different senses. He notes that the importance of bodily significations has diminished, and in a sense the body has been excluded from the physical world around the turn of the millennium. Is our need to touch and feel emphasised as we create an increasing gap between humanity and a digitalised vanishing reality?

3 **Most, Henrik.** (2005). *On craft as a boundary wrecking ball. In Love Jönsson (ed.) Craft in Dialogue. Six views on a practice in change.* Stockholm: Craft in Dialogue IASPIS, p. 15

This publication is constituted of three parts. The first part is a visual essay that shows via images and short texts what was experienced during the workshop that took place at the KAHLA Porcelain factory in April 2016. The second part is constructed from the articles introduced above. The aim of these texts is to provide a context for the *Shaping the Future* module and the underlying discourse. Finally, the third part of the publication presents images of the final works that were selected for display as part of the touring exhibition.

This EU project that is being conducted over the period 2015–2018, has been made possible with the *Creative Europe* funding. In addition, we are grateful to the Finnish Ministry of Education and Culture, which has generously funded *Shaping the Future* module. The possibility to conduct the workshop at the KAHLA factory with the support of the entire staff was an invaluable starting point for the entire module. As the link between KAHLA and the project, Barbara Schmidt contributed greatly to its success, and with her attentiveness and endless energy, Carolin Wachter from Berlin Weißensee supported the success of the workshop in a multitude of ways. We also truly appreciate the input from Kolja Vennewald, a student from Kunsthochschule Berlin Weißensee, who designed the structure of the travelling exhibition. To Dr Karthikeya Acharya, Architect and Design Researcher from Aalto University, we are grateful for helping us design the exhibition architecture in Fiskars. The related publication would not have been possible without the student group from Kunsthochschule Berlin Weißensee, and particularly Toni Brell, who took the main responsibility for designing the visual format of the catalogue. Finally, we are grateful for Damon Tringham who carefully crafted the texts into proper English.

Helsinki 12.8. 2016

Maarit Mäkelä, Tapio Yli-Viikari and Riikka Latva-Somppi

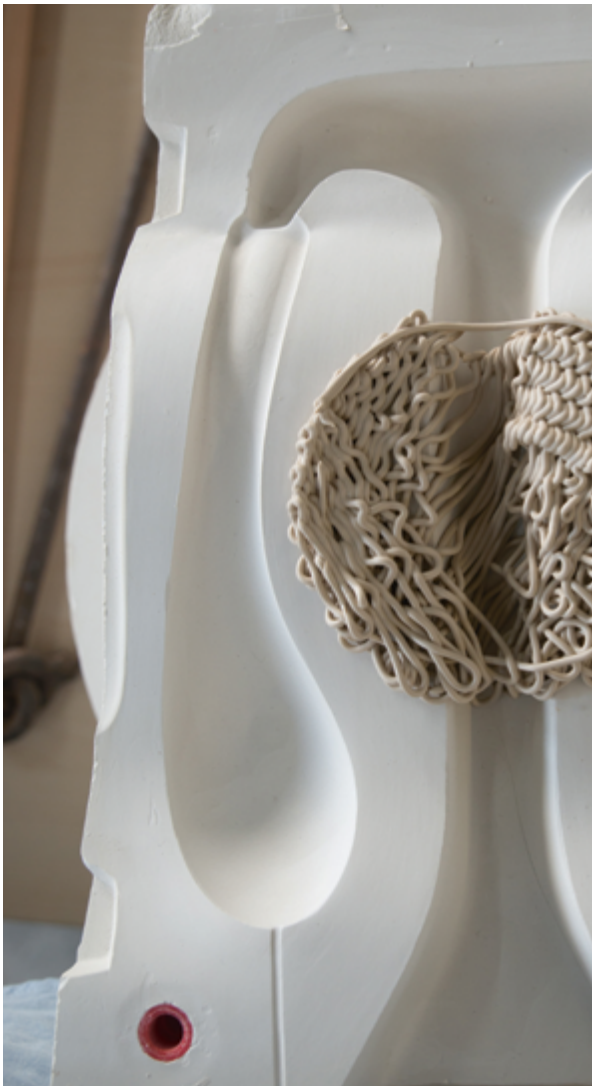
Maarit Mäkelä *(Doctor of Arts) is the Head of the* Shaping the Future *module and the Associate Professor of Practice-Led Design Research at the Aalto University School of Arts, Design and Architecture in Helsinki, Finland. She also works as an artist in the field of contemporary ceramics. She is interested in explorative creative processes and in particular, how reflective diaries and visual documentation can be utilised for capturing the author's personal process.*

Tapio Yli-Viikari *is a Professor emeritus from Aalto University, where he worked as a Professor of Ceramic Art for the years 1986–2016. Prior to that, after graduating from the University of Art and Design Helsinki, he worked as the Design director and Head of Art and Design at Arabia Porcelain factory, Helsinki, Finland. He has been a jury member in numerous international competitions and received the Finnish State Design Award in 1978.*

Riikka Latva-Somppi *(MA) is an artist curator and educator working in various assignments involving expertise in the field. She works at the intersection of fine art and craft and has exhibited widely nationally and internationally. Her public art work* Satakieli/Nightingale *was awarded The Certificate of Environmental Art 2009 by The Foundation of Environmental Art (Finland), and her public art work commissioned by Vantaa Art Museum has recently been published in Tikkurila, Vantaa, Finland. She has worked as a part-time lecturer as well as in various positions of trust and evaluation at Aalto University, School of Arts, Design and Architecture, Helsinki, for the past twenty years.*

Part I The KAHLA Workshop


Porzellanfabrik



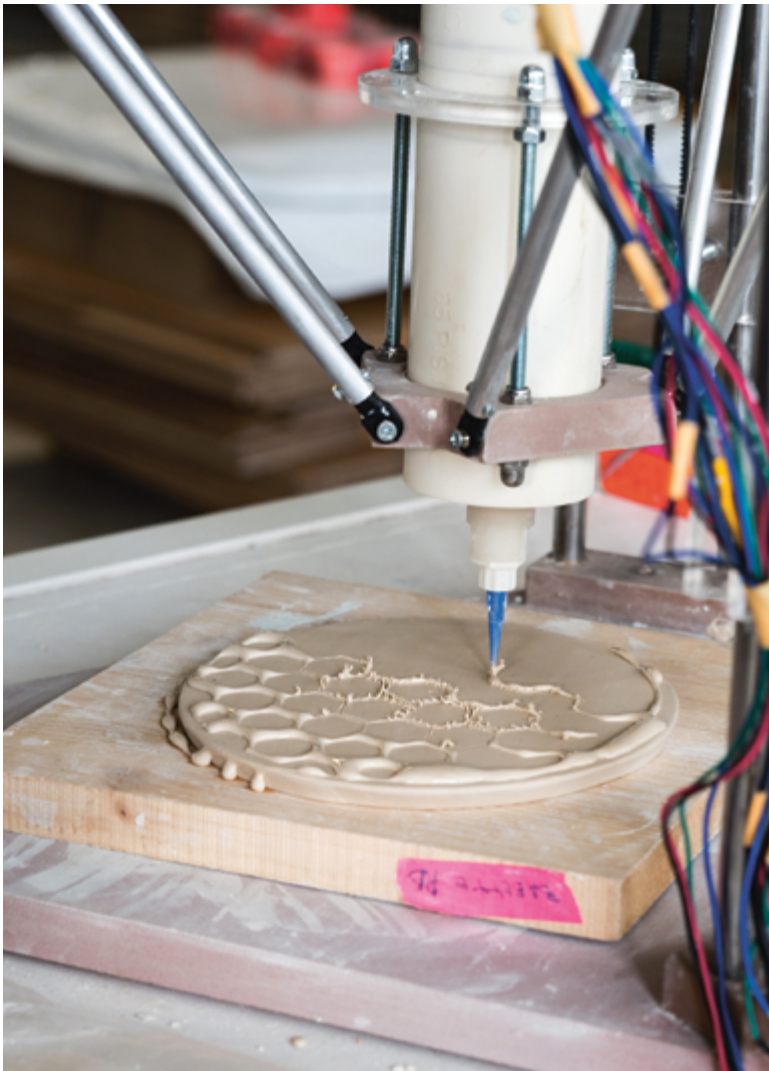
Hilda Nilsson: The KAHLA Experience

I was invited to participate in the *Shaping the Future* workshop by my teacher at KADK because he knew I had previously worked with 3D-printed ceramics and had an interest in it. I did not know what to expect from the workshop, besides that it was going to be intense.

It turned out to be one of the most inspiring weeks I have ever had. It was an overwhelming thing to work in the surroundings of a porcelain factory of that scale, to meet new people from around Europe, to be almost closed off from the outer world and to be thrown into such a creative bubble. It took almost two days before I felt comfortable and found my way around. By then, I wanted to stay a month because a week felt far too short.

I did not bring with me any exact plans of what I wanted to do, and, for me, I think that was a good thing. It made me explore the possibilities that the factory offered as I went along, and also collaborate with the other students.

When I came back, I had a notebook full of ideas, and a mind nurtured by many inspiring conversations. The workshop was the foundation of my continuous work during the rest of the semester, and it influenced the way I worked with my process. Working at the KAHLA workshop was different to the one I was used to. If you came up with an idea, you just carried it out without hesitating. This created a very productive atmosphere, and I tried to continue that way when I came back. It was the conversations with some of the other students that made me think outside the box and work differently with ceramics to how I had done before.



Yaara Rabinovitch: Feeding the machine

Once you step into KAHLA, time gains a different meaning. Everything happens at its own intense pace, as if there is no other reality besides that of the present.

When you pause, you understand how much you have produced without noticing.

During the workshop, I decided to work with the jiggering machine, which is used in the manufacturing of round and symmetric shaped tableware. During the week, I was given a short window of opportunity to stop the machine and use it for my own experiments.

I ›fed‹ the machine with the remains of different sorts of food from our breakfast, wished it *bon appétit* and let the machine work its magic. The food made its way through the machine's stomach, was digested into the kiln, and the end result was an empty vessel, but with food traces appearing and disappearing in its body.

When we see a piece of tableware – a bowl, a plate, a cup – we know it is going to be filled with food or drink, then emptied, cleaned, filled, emptied and so on, in the cycle of use.

The bowls that resulted from my experiments have the recognizable KAHLA fine edges, but they are also expressive and cracked. These bowls from the mass industrial line are now no longer identical. The food is twisted, it is placed on the outside of the bowl rather than within the inside.

My research in the KAHLA factory was a process of learning by doing, sending ideas to the fabricator. At my best, I managed to produce fifteen different bowls in half an hour. In this experimental work the quantity is important, and it can only be achieved in a factory.

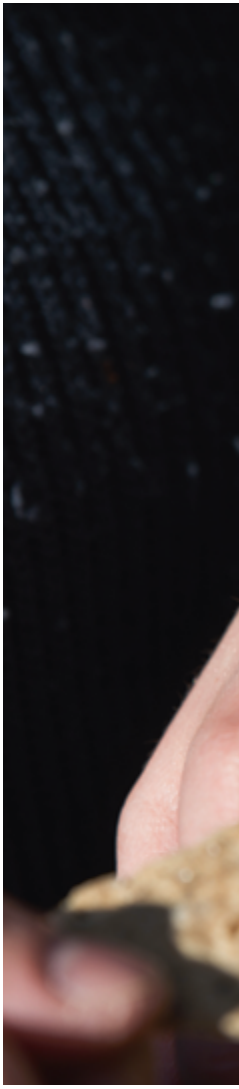
In the factory, I was not the physical maker. I was the feeder. The main idea was to interfere in the factory's rational mass production, add another layer to the subtle and often overlooked interactions we have with everyday objects.

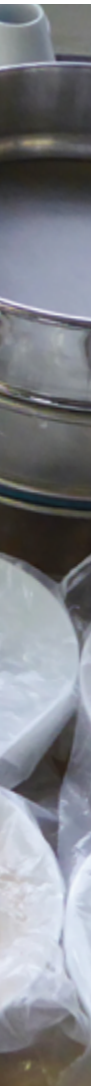
Rhiannon Ewing-James: Made in KAHLA

Working as part of the *Shaping the Future* workshop, my eyes were opened to the experience of how modern porcelain production works. I was particularly struck by the relationship between the factory workers and porcelain, one that is very different to that of a ceramicist, designer or artist. The normality of porcelain pouring from hoses, the act of glazing or decorating a bowl to perfection, the hordes of impeccably white and glossy products and the mountain of broken shards and porcelain waste influenced and greatly inspired the conceptualisation of my new body of work and the experimental making process I utilised as part of the workshop.

My project began with a fascination with material culture and the hope to explore a combination of materials in order to reflect a tactile relationship with materials. My experiments began with decorating porcelain with concrete, then casting concrete plates with which I could include porcelain shards and a distorting stamp and decal decoration. With the intent of capturing and exploring a tactile dining experience, I was inspired by conversations with and the experience of the *dilettantin produktionsbüro* duo. I then became aware of the space the cast concrete plate occupies and how it represent the space of a plate in which we eat, and additionally how material plays such an important role in the experience of dining.

During my time at KAHLA I gained a wonderful insight into the creative practices of the other participants of the workshop. The lecturers and participants shared knowledge and experience that speared fantastic and inclusive conversations concerning what the future of ceramics could look like. The *Made in KAHLA* series hopes to inspire a familiar tactile dining experience through the experimental combination of contrasting materials in tableware. The use of concrete and porcelain illustrates the importance of materials ingrained in our everyday and historical European culture.





Saija Halko, Hanna-Kaarina Heikkilä and Tuuli Saarelainen: Spirit of the Place

Spirit of the Place was born during the KAHLA workshop, and the idea was to work with the concept of using the local resources and materials. We wanted to pay more attention to the meaning of the local spirit, materials and resources that are available and use our experiences in creating unique products and art objects.

During the intensive week of the workshop, we were privileged to experience the factory process and atmosphere as well the local Kahla village environment. The factory worked as a great source of inspiration, with its production volume and repetition.

We were photographing the surroundings and playing with the resources that we could find. By using the waste materials found at the factory site and in nearby areas, and by combining traditional techniques, material research and new technology, we created works in which the features of the local area can be seen. The work *Spirit of the place* consists of five different collages and complementary photographs.

We wanted to show how important it is to move forward with a great awareness of where we are coming from and where we are heading to. With an open-minded attitude, we came up with a series of art pieces that all capture the spirit of the place in which they were made.

Victor Gonzalez and Ji Hye Kang: Melodic Scribe
Melody is a progression of musical tones that the listener perceives as a single entity

In the corridors and rooms of a factory runs a whisper of a piano; the sound is born, along with other great ideas, in the experiment room of the KAHLA Porcelain factory.

We are two designers from Berlin, and we were invited to the workshop *Shaping the Future* to present our project *Melodic Scribe.* The porcelain pieces, which were used in presenting the project, were produced at the KAHLA Porcelain factory.

How can one make music visually perceivable? This question is the subject matter of the Melodic Scribe experiment. In the experiment, sound impressions are transformed into colourful patterns through the use of simple machinery. The resulting patterns are incorporated into the manufacturing process of porcelain.

We started first to work on the questions of how we could convert musical perception in a new and progressive way, how we could include other sensory organs with the perception of music, and how our experiment would influence the perception of social behaviour. Thus, we developed the idea of expressing music with colours. To do this, we chose to realize the impression of colours on the surfaces of dining plates, this time on the porcelain plates of the KAHLA factory. A new, rather poetic, design and at the same time a useful product was created by the mélange of two distinct disciplines: music and manufacture. After colouring, the plates were burned to obtain the final form. A set of dishes was created – an original crafting by musical pieces.

Henriette Ackermann: Combine/Connect

Combine / Connect is an ongoing project that was initiated in the workshop at the KAHLA factory. The project is an adaptive contemporary tableware set that encourages the user to set the dinner table in a playful way. The idea behind this project was to rethink traditional ceramic ornaments, to create a non-static pattern that becomes an active part of the social interaction during mealtime.

The traditional KAHLA tableware with the blue onion ornament was the inspiration for the project. The question was whether the pattern could be more than purely decorative. Prior to the workshop, we produced sketches of alternative patterns based on digital graphic data kindly sent to us by the company.

Despite all the preliminary preparation, it turned out that it was much more exciting to react to the possibilities that were offered at Kahla. A very interesting visit to a small ceramic screen print studio, located in the neighbourhood of the porcelain manufactory, and finally the in-house ceramic decal storage offered new dimensions for the developing process of the project. Instead of working in a well-organized, linear way, it was much more rewarding to use the creative atmosphere of the workshop for the design to be more open to improvisation. Also, the possibility to exchange and discuss ideas together with the international participants, the professors from different universities and the staff at KAHLA shaped the final idea for the tableware.

The result is a concept for the *Combine / Connect* tableware that has the potential to be developed further: a traditional pattern that usually decorated the rim of a piece of crockery has been cut
and slightly shifted aside so that the ornament overhangs the edge. Thereby, the pattern creates an open circle that allows itself to be continued on a second piece. Once multiple pieces are combined, the blue and white ornaments form a decorative, shaped imaginary line on the dinner table. By turning the crockery, a unique overall pattern can be created at the table.

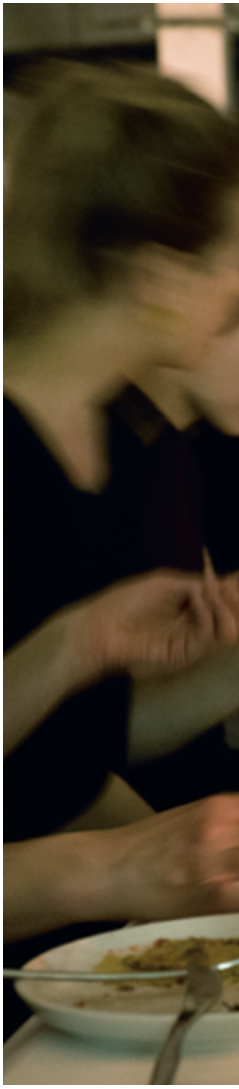
Anneli Käsmayr / dilettantin produktionsbüro:
Savour, Emotion and Play

Taste as part of our perception of our senses is a personal and unique matter that triggers both emotional, cultural and social imprints. We speak (and think) differently when we eat and drink. The ability to taste makes sense when explored evolutionarily: we are genetically programmed to distinguish nourishment from poison by flavour. At the same time, our gut feeling indicates whether a situation or person is doing us good or not. This is called intuition, and just like tasting it has much to do with body awareness. Thus, the practice of using our senses helps us to feed not just our body, but also our soul and mind.

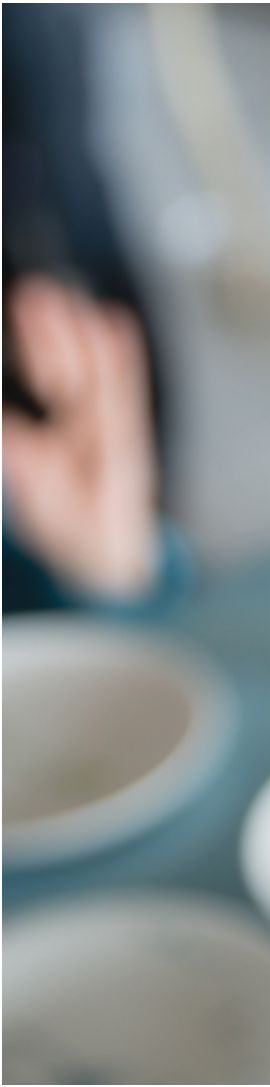
We started the workshop *Texture and Spring* with a field trip into the surrounding Thuringian woods in order to explore edible nature and to collect greens for our meal. Coming together to find, prepare and share food is the oldest social basis of human community. In celebrating the act of eating together we not only nurture our bodies but also stabilize the social body of our community as well – moments of conviviality and dialogue make for memories and at the same time open our senses to what we perceive. Potentially, the more we enjoy the more we can sense and discover and the more we obtain in return. It is a question of resonating with the world in a good way.

For *Texture and Spring*, we also added another element, play. All food was prepared in a very simple way and in several textures. Rhubarb was marinated raw as well as cooked, Jerusalem artichokes were prepared cooked, smoked and puréed, and the skins were baked to a crunch. There was caramelized asparagus, asparagus salad and asparagus ice cream. Ultimately, there were more than twenty different elements created from the food we had collected together. These elements invited the participants to play with textures, flavours, aroma, colour and arrangement, and to create a unique and personal plate of food for pleasure and to share it on a long table with everyone else.


Toppings
Super
fine
fermented
eggplant
Bread




MAROSS
CALIFORNIA



Participants

Students

Saija Halko, FIN
Tuuli Saarelainen, FIN
Vesa Kattelus, FIN
Hanna-Kaarina Heikkilä, FIN
Joel Wolff, FIN
Hilda Nilsson, DK
Yaara Rabinovitch, DK
Niamh Conlon, NI
Liz Carrasco, NI
Shannon Elias, NI
Charlie O'Hagan, NI
Caitriona Aldridge, NI
Caitlin Carleton, NI
Henriette Ackermann, GER
Maria Braun, GER
Sarah Bräuner, GER
Maximilian Bellinghausen, GER
Laura Görs, GER
Elisabeth Hammann, GER
Babette Wiezorek, GER
Dawei Yang, GER

Professors, Teachers and other project personel

Tapio Yli-Viikari, Professor, FIN
Nathalie Lahdenmäki, Teacher, FIN
Priska Falin, Project Coordinator, FIN
Tomi Pelkonen, Teacher, FIN
Riikka Latva-Somppi, Exhibition curator, FIN
Barbara Schmidt, Professor, GER
Sabine Selmke, Teacher, GER
Carolin Wachter, Teacher, GER
Flemming Tvede Hansen, Professor, DK
Michael Moore, Professor, NI

Rhiannon Ewing-James, Teacher / Workshop assistant, NI
Björn Bernt, Teacher / Workshop assistant, GER

Invited lecturers

Ashish Mohite, Aalto University, Digital Design Studio, FIN
Dries Verbruggen, Unfold Design studio, BE

Invited artists

Anneli Käsmayr, dilettantin produktionsbüro, GER
Victor González, Melodic Scribe, GER
Ji Hye Kang, Melodic Scribe, GER

Other

Kolja Vennewald, project documentation, exhibition design, GER
Valentin Selmke, cameraman, GER
Meng Wang, Aalto University, Digital Design Studio, FIN
Björn Hille, dilettantin produktionsbüro, chef, GER

Part II **Articles**

Francesca Zampollo **Ceramic Food Designs. A conversation with Barbara Schmidt and Nathalie Lahdenmäki**

I have always been fascinated by ceramics. I looked at a pottery wheel with open enchanted eyes, and probably an open mouth. The rotating object would take my mind away from the present moment in a hypnotising fashion – just plain fascination. To my untrained eyes, handling clay is an intriguing skill and craft. So much so that when I enrolled in a short throwing course a few years ago, I was thrilled. It took me very little time to realize how much technique is involved in handling and manipulating clay, and with this realization my admiration for all ceramicists grew even more. It is therefore a great pleasure for me to be able to have a conversation with two very talented designers who use ceramics as their material of choice: Barbara Schmidt and Nathalie Lahdenmäki. Barbara, designer at *KAHLA*, uses a more industrial approach, and Nathalie, designer at her own studio *Nathalie Lahdenmäki*, focuses on small-scale productions. Both Barbara and Nathalie are award winning designers who work as practitioners and also teach at university level, Barbara as Professor of Experimental Design at Weißensee School of Art (Berlin, Germany), and Nathalie as a lecturer at the Aalto University, School of Arts, Design and Architecture (Helsinki, Finland).

My understanding of ceramics is simply that of an admirer, but I do understand Food Design and designing for food, the area in which Barbara and Nathalie operate the most. As we now know, Food Design is a large discipline that encompasses many different areas of knowledge, education and skill. One of the contributions I have personally made to this field is creating a sub-categorization of this discipline that emphasises the background discipline with which one approaches Food Design[1]. Since there are far fewer graduates from Food Design courses than there are people working in Food Design, we know the vast majority of Food Designers have a background in other areas: product design, culinary arts, interior design or food science for example. According to the Food Design categorization I have proposed, both Barbara and Nathalie operate within Design for Food, as they create objects designed to contain, present and sometimes cook food; they design the food vessel.

1 **Zampollo, Francesca** (2013). *Food and Design: Space, Place and Experience [Editorial].* Hospitality and Society, 3(3), pp. 181–187
Zampollo, Francesca (2013). *Meaningful Eating: a New Method for Food Design.* (PhD), London Metropolitan University, London
Zampollo, Francesca (2015). *An edible taxonomy.* Experimenta, 67/68, pp. 156–171

In this article, we shall explore how what they do fits into the Food Design world, and we will open a small window into the wonderful minds of these two excellent and accomplished designers. While you read this article, you can imagine three Food Designers, three academics, three women having a conversation about food and design while holding a cup of tea. A ceramic cup of tea of course.

Francesca Zampollo Barbara, Nathalie, thank you so much for having this chat with me. I've come to know your work and admire both of your approaches to Design and ceramics, and I have really fallen in love with your work. I look at it from a Food Design perspective of course. I define Food Design as being the connection between food and Design: Food Design is the design process for food and eating related concepts.[2] In this sense, it seems to me that you both are clearly Food Designers. How do you think ceramics fits into the Food Design discipline?

Barbara Schmidt Ceramics are the single most important material used in the production of tableware.

Nathalie Lahdenmäki Ceramics serves Food Design perfectly, firstly by providing interesting tools for serving food. It functions as a background and frame and helps in creating a certain atmosphere for the event. Ceramic tableware has a strong and very long history. Most of the basic shapes suitable for liquids and solid food have been discovered already. The emphasis now is more on re-finding proportions and balances of inner and outer surfaces for example. At least for me, this is still fascinating!

FZ What does it mean to you to be a ceramicist?

BS I am an industrial designer and an educator. I work with ceramics in an industrial context, and I receive my inspiration from the direct, experimental exploration of the material, which also results in non-industrial works.

2 **Zampollo, Francesca** (2015). *Welcome to Food Design*. International Journal of Food Design, *1*(1), pp. 3–7

NL For me, ceramics has become the best media for expressing my thoughts and feelings.

FZ What fascinates and interests you about ceramic?

BS I have been fascinated by ceramics and porcelain since my early childhood. Still, during my studies at university, I rather accidentally came to ceramics.

NL I enjoy the combination of art and design (and craftsmanship) that ceramics offers to the maker. I was first interested in drawing and painting, then in working with clay by hand and the total concentration and silence that it required took over me. This happened in high school.

I actually enjoy some repetitive and monotonous moments in the making itself. Also, in studio production, I think it is good to be able to emphasize details that couldn't be done in industrial production, like playing with the distortion during the firing, the thinness of the material and possibility of a variety of colours and glazed or unglazed surfaces in one object. Very subtle things that make a difference in the final object.

FZ Food Design is indeed a Design discipline. Design theorists have spent a lot of time trying to understand and define the stages of the Design process. Baxter visualises the design process as the ›stairway to creativity‹, describing the different phases as first insight, then preparation, incubation, illumination, and verification.[3] Tim Brown, the CEO of IDEO, calls the phases of the Design process as »the ›three spaces of innovation‹: inspiration, ideation, and implementation«.[4] In addition, Dubberly wrote an entire book listing one process after another and, most importantly, showing how the creative process, or the problem solving process, in different disciplines is similar.[5] Can you describe your own Design process?

BS During my time as a designer at KAHLA, I have been fortunate

3 **Baxter, Mike** (1995). *Product Design. Practical methods for the systematic development of new products.* London: Chaoman & Hall
4 **Brown, Tim.** (2009). *Design by change. How design thinking transforms organizations and inspirers innovation.* New York: Harper Business
5 **Dubberly, Hugh.** (2005). *How Do You Design? A compendium of models*

to have never really received very detailed briefings. There was always a framework defined, which sometimes determined the area of application, such as private homes or the restaurant sector, and which established some specific requirements, for example, the option to use the object both for eating and for preparing food, or objects for young, mobile households, or sometimes also to create a particular ambiance. With each new project, there are those questions at every turn. I observe, I jot down my thoughts in tiny drawings, and I try to transfer them as straightforward as possible into 1:1 plaster models. Creating these models myself is an important step in the design process. Sometimes, I conduct some culinary research, such as when I developed cups that promote the celebration of the perfect cup of coffee. I present my design to the KAHLA team and incorporate their feedback during the process of refining the design. In the course of a development process that takes many months, sometimes years, I assist with the realisation of my designs in production, working in close collaboration with the model department and the technicians.

NL When it is a brief coming from a company, I need to research the company's background and identity first, if it is not familiar to me. Inside the narrow frames of the given task, the company identity, the production techniques and the target group, I need to find a new angle of my own. But first of all, I need to get inspired! This happens by looking at what has been made in the past, sketching, and sketching different things, too, in order to feel free. The frames are not constraints but actually give the freedom to start the work immediately. The first ideas fly from irrational to very logical, partly instinctively and partly by clarifying the main focus step-by-step. It is a lot about making choices and leaving ideas behind.

FZ It is interesting to me to hear how sketching is an important part of your process for you two. It seems sketching is for both of you an »exploratory, sense-making process«, as Mäkelä,

Nimkulrat and Heikkinen[6] describe it, a process »where the observer, and the thing or idea observed, are inextricably bound together in a physical, material space/time relationship«.

NL In my own studio, the process is very intuitive. I just trust my own taste. The need to make a new shape might come first from a request from a customer. Many times, after some reflection, I end up designing new objects from this initiative. The tableware series I produce at my studio grows little by little, by one or two new shapes in a year. The sketching is often really quick, going to rough technical drawings and moving soon to model making by hand, on the plaster wheel or by hand carving. That's the phase I prefer, and also the slowest one. For more complex shapes, I might turn to 3D printing or CNC carving. I try to find the most appropriate method for each shape.

In the making of unique large vessels, the technique I use is hand coiling. It is very slow and meditative. I do one quick drawing just to get the basic measures, but the final piece really grows little by little, intuitively, in my hands.

For a recent project, I designed and produced tableware for a Danish restaurant (Figure 1). It was interesting listening to the chef´s strong vision. The simple, grey matt tableware I created act as silent bases for beautiful food. They are tools that have an important role, lay actors in a bigger play. It is drama.

FZ I love that: »it's drama«. It really is, you're absolutely right. Design For Food is about designing those tangible objects that are there to create the perfect scenario for the food itself; they set the tone, they create the atmosphere, they create expectations for the crescendo of stimuli that culminates in the flavour of the food itself. I believe all these tangible elements, too, are a crucial part of the design of what Zomerdijk & Voss[7] call the *dramatic structure* of the service experience. It's been established now that a meal, including of course its non-edible components, can be designed to emphasize its dramatic potentials[8] and can – I would argue that it should – be treated like theatre.

6 **Mäkelä, Maarit / Nimkulrat, Nithikul / Heikkinen, Tero** (2014). *Drawing as a Research Tool: Making and understanding in art and design practice.* Studies in Material Thinking, p. 4

7 **Zomerdijk, Leonieke G. / Voss, Christopher A.** (2010). *Service Design for experience-centric services. Journal of Service Research,* 13(1), pp. 68–82

8 **Morgan, Michael, Watson, Pamela / Hemmington, Nigel** (2008). *Drama in the dining room: theatrical perspectives on the foodservice encounter.* Journal of Foodservice, 19(2), pp. 111–118

Fig. 1 Tableware designed and produced by Nathalie Lahdenmäki in use in Restaurant Relae, Copenhagen.
Photo: Luca Donninelli

I'm pleased, and not surprised at the same time, to see that both of you include in your own Design process a moment in which you look at food or eating, and try to understand it, or aspects of it, in order to transfer what you learn into your products. I have proposed a branch of Design Thinking that is specific to Food Design, called Food Design Thinking, arguing that there is a space for a set of Design Methods that are specific to the Food Design process, specific to that moment in which we look at food or eating.[9] In your opinion, in terms of your Design process, is there any difference between designing a ceramic object for the food/eating context, and for any other context? Do you think

the designer does anything different when designing, for example, a cup or a plate, or when designing, for example, a lamp?

BS At the beginning of my work as a designer, I looked at designing tableware primarily from a formal point of view: for a coffee set, it was important to co-ordinate all the pieces in their form and design. The functions of the pieces were more or less clear. Later, I increasingly incorporated the aspect of using the objects, the process of cooking, plating, serving and the process of enjoying the food itself, the way we handle tableware today and the way we live with it. A few years ago, the process of preparing food started to play a bigger role in my teaching. We talk about edible and non-edible matter that we design. I believe that this approach influences the results of the design process. It is no longer just about designing individual objects but rather about their use in a specific scenario, one which is developed along the way. This is also a great approach to achieve a new quality in designs that break away from the history of ceramics, spanning thousands of years, while still honouring it.

FZ How do you think the eating experience changes when the object is made of ceramic compared to when it is made of wood, plastic or steel? What do you think is the difference between eating from a ceramic plate for example, and eating from a plastic/wood/metal plate?

BS Ceramics, in particular ceramics fired at high temperatures such as porcelain, are chemically inert. This means the material does not have a taste of its own. Its relatively high weight, its sound, its delicate surface makes it seem much more valuable than most plastics, for example. Wood is a high-quality material derived from the natural world and therefore ›alive‹. It has an interesting surface and tactile qualities. It is suitable for certain applications in the food context, but wood is porous and therefore absorbent, which has disadvantages when the material comes into contact with the lips and tongue.

9 **Zampollo, Francesca & Peacock, Matthew** (2016). *Food Design Thinking: a branch of Design Thinking specific to Food Design.* Journal of Creative Behavior, 50(3), pp. 203–210

NL Metal and plastic have their own roles in cooking. They are great for the outdoors, for hiking. Wood is great for chopping. But if you take a ceramic cup outdoors, it becomes luxury! I actually play with this thought when designing unique picnic sets out of porcelain: They become small installations or *natures mortes*, there is simply the idea of taking them out to the mountains with someone you love …

FZ Where does your interest in creating ceramic objects for the food context come from?

BS Eating is one of my favourite things to do. I like to handle the material directly, both when cooking and when working with ceramics, and I like the fact that different senses are engaged during the process and when enjoying its results. Cooking and the production of ceramic objects used for food are anthropological constants. They are universal and fundamental for all cultures – the exploration of this subject creates a connection to this wider context.

NL Eating and drinking is great! It is something everyone needs every day. The aesthetics of the everyday and bringing comfort to it just feels valuable.

FZ I love what you both say here. Exploring the production of ceramic objects does indeed create a fundamental connection to all cultures, and it really is about bringing comfort to people, which is definitely valuable. I have always been an advocate of a Design approach that aims at designing *beyond* the object,[10] and designing for meanings as proposed by Verganti.[11] I align with the concept of designing ›meaningful interactions‹,[12] and in turn with the shift from designing solutions to designing possibilities.[13] From your words, it seems to me that ceramics, and specifically ceramics used for food or eating, is the perfect vehicle to achieve meaningful solutions.

10 Redstorm, Johan (2006). *Towards user design? On the shift from object to user as the subject of design.* Design Studies, 27(2), pp. 123–137

11 Verganti, Roberto (2008). *Design, meanings, and radical innovation: A metamodel and a research agenda.* Journal of Product Innovation Management, 25(5), pp. 436–456

12 de Medeiros, Wellington Gomes (2014). *Meaningful Interaction with Products.* Design Issues, 30(3), pp. 16–28

13 Jensen, Jasper L. (2014). *Designing for Profound Experiences.* Design Issues, 30(3), pp. 39–52

NL I truly think that I can express things that cannot be expressed by words through my work in the ceramics field. The qualities of the material inspire me in ceramics. I am mostly interested in the texture, shape, weight and colour combinations of objects. Ceramics is a delicate material. Culturally, to me ceramic vessels refer to something simultaneously very permanent and fragile. In my newest works, I consider the idea and value of preserving as a relevant theme. Vessels are like shelters, idea keepers.

BS My industrial designs are intended to be durable and suitable for everyday use, but they should also be aesthetically timeless and fit the different lifestyles of today. I also always aim to enhance the perceptions of the senses during the act of eating. In my own independent work, I also always like to incorporate an element that cannot be easily explained, at least not immediately, that is hidden or subversive, thus leading to a particular perception.

NL Ceramic can give warmth, a feeling of belonging to a tradition and object culture. Tableware has traditionally been handed down from mother to daughter, inherited through the generations, and it will last after us. Its design should last, too.

BS Eating creates ever-new pleasant experiences for the senses, both when preparing the food and when enjoying it. Food makes us happy. Eating is a social affair, which is deeply rooted in our culture. It creates a cultural connection to our ancestors. Eating is not only a necessity of life, it also strengthens interpersonal relationships and fosters social cohesion. Most of the time, eating also means sharing.

NL Food brings instant satisfaction. The fact that the act of eating and sharing a meal with other people is ephemeral makes it very special. A meal or an event never lasts forever. People are aware of this and become mindful of the moment.

FZ What do you like about ceramics as a material to create? Why do you prefer it to, for example, wood or metal?

BS Ceramics feel good to the touch. I like the casting process where the object goes from positive to negative and back to positive, the transformation of the material during the firing, and the ever-new surprises that are created by the firing process. The mix of precision and coincidence. Porcelain in particular has many wonderful properties: it is harder than steel yet fragile, translucent and resistant to chemicals, has the ability to display surface structures with a high resolution and has a great sound.

Ceramic dishes frame our food in an appropriate, distinguished way whereby they enhance the sensual experience. They have been a part of our culture for a very long time. As Nathalie also remarks, often they are handed down from one generation to the next, even today. Many aspects of their design have their origin in the beginnings of our culture. If we take a closer look, we will also find a large number of applications for ceramics that have nothing to do with eating or drinking (ranging from bricks over artificial hip joints to circuit boards), a great potential that has a lot to offer to designers.

NL Ceramic is a hard and long lasting material, but the atmosphere it brings is very warm and soft. Ceramic brings a bit of eternity, remaining fragile. An interesting contradiction that is part of life!

BS We are connected to the natural world through cooking and eating (this phenomenological point of view is shared by, among others, Michael Pollan and Hartmut Rosa). Cooking is material science, alchemy, chemistry, a process that appeals to the senses, design: »Eating engages our senses and is part of our culture. Not least because of this fact, eating in all its aspects is an almost inexhaustible research subject for numerous scientific disciplines such as materials research, design, cultural anthropology, history, biology, physics or chemistry.«[14]

14 Vierich, Thomas A./Vilgis, Thomas A. (2013). *Aroma.* Berlin: Stiftung Warentest

FZ What do you think is the connection between ceramic objects designed for food or eating, and the food itself?

BS The connection between the vessel and its content is essential. That does not mean that a design must always relate to a specific content. A cup can be specifically designed for a particular way of preparing coffee, while a medium-sized bowl can be intended for a variety of different foods or beverages. At the same time, a vessel for eating food can also be used for food storage or to prepare a dish. Speaking of connections: the connections between the vessels themselves are also interesting. Cups with saucers, different cup sizes within one series, pots with lids, cups with pots etc.

NL I mostly choose to stick to quite archetypical shapes of objects. I might vaguely choose a purpose for the new object, and start from examining its proportions in shapes. If a certain shape suitable for a certain function does not satisfy me, I might just not do it. An example of an item like this would be large, high mug. Smaller is better, and people can pour more if they like! I think that functionality is frequently overvalued in Scandinavian design. My philosophy is that people should create a relationship with the objects they use. If they like it, they will use it, despite little inconveniences in functionality, such as piling for instance.

FZ From a Design perspective, what do you think is the connection between ceramic as a material and food as a material?

BS That is an interesting question. In fact, the textures and processing methods of producing ceramics and of cooking when preparing dough for example, or liquids, are quite similar. They also have in common that the textures of the materials change. This includes the transformation when heat is applied. In addition, there is frequently a feedback between action and perception. However, when working with ceramics, the gustatory and olfactory aspect of the sensory perception is limited. Raw clay

does have a particular smell though, which partially comes from decaying organic components. It is not always pleasant. This smell completely disappears in the firing process. In the project *Consistencies,* we explored the parallels in the nature and consistencies of edible and non-edible matter and incorporated our findings into the design of a multi-course meal. For example, for the project *Sans Cuillère* (Figure 2), the students Maria Braun, Laura Görs, Idalena Rapp and Natascha Unger made a few hundred half spheres in seven sizes and different shades of white to stage a white tomato soup with white ingredients to be added by the eaters. The idea was that through the instability of the footless bowls, the consistencies of the ingredients could be sensed more intensely. There were no tools, just bowls and bread for eating the soup and having wine and water. For the project *Moment* (Figure 3), students Maho Horiuchi and Ayumi Wayabe designed a dessert: a jelly dyed with herbs that would change colour through contact with frozen lemon juice. It was served on plates with matching fluid forms, made by casting porcelain on plaster slabs.

NL I have an example of experiencing these senses that has affected me a lot recently and which I'd like to share: entering a small coffee shop in Lalibela, Ethiopia. A woman sitting on a stool was cooking coffee on a small ceramic charcoal grill close to the entrance. A dense smoke was the first sensation walking into the dark space. Then a delicious smell of coffee and fresh grass! The grass was spread around the grill, apparently an old tradition for welcoming people in. I felt very welcome! Hot sunshine outside – dark and cool inside. The coffee pot was an open fired earthenware pot with traces of smoke on it. The cups were ordinary, industrially-made small porcelain cups, but I think I could imagine the smell and taste of rough earthenware in the hot, dark roasted coffee.

FZ Let's talk about Design education for a moment. Can you describe an interesting project you have proposed to your students, and how you have seen the students respond to it?

Fig. 2 Student work for *Consistencies. Sans Cuillère* by Maria Braun, Laura Görs, Idalena Rapp and Natascha Unger.
Photo: Sans Cuillère

BS At the Berlin Weissensee School of Art, we have experimented in this area with several projects. Ulrich Krauss from the Zagreus Project that combines cooking and art, my colleague Christiane Sauer (Professor for Textile and Surface Design) and I together with a group of students of Textile Design and Product Design developed a multi-course meal with all the ingredients (tableware, food, space) based upon the subject of consistencies. For this project, we worked with different materials which we only classified as either edible or non-edible matter.

This winter semester, we and our students explored the possibilities of using ceramic materials in the production, presentation

Fig. 3 *Moment* by Maho Horiuchi and Ayumi Wayabe.
Photo: Hanns Joosten

and consumption of food. The resulting designs range from a refrigerator that does not need electricity through crockery for making sauerkraut and ginger beer to plates that invite the user to lick them clean. In collaboration with the *Entretempo Kitchen Gallery* in Berlin, the designs were tested by guests over the course of three dinners.

We started the project *Table Tools* (Figure 4) with an initial workshop on artisanal, industrial and digital ceramic techniques – after all, our students study product design and not ceramics and therefore need to learn the basics within one semester in order to successfully develop a ceramics project. This

was followed by a fermentation workshop with the artist Michael Fesca and with Tainá Guedes of the *Entretempo Kitchen Gallery.* This way, there was a close conceptual relationship between the ceramic materials and the edible materials from the very beginning, and the designs were developed mindful of the aspect of their use in connection with food.

At the moment, I am working with students on a project called *Off the Table* – this project explores applications of ceramic materials that go beyond tableware. The broad spectrum of applications is fascinating, and so are the options for designs that do not have to conform to rotational symmetry. Apart from that, the process from idea to prototype is very similar to the design process within the food context.

NL At Aalto University, School of Art, Design and Architecture, Helsinki, we start the first semester with 1st year design students by giving them the task of designing their own tableware. The students get familiar with wood, metal, textile, glass and ceramic as well as 3D-printing workshops designing and producing objects for their food set. At the end of the course, we gather around a long table: we eat and drink together, everyone using his own brand-new design. What could be a better way to get together and learn from each other than to eat together and to share ideas! That is what food culture is about.

In my opinion, Food Culture is a very appropriate and challenging design task for students. It is also very interesting, since eating and drinking has become such a complex phenomenon. A lot happens all the time regarding this subject in our surroundings. It is certainly a theme that strongly reflects the changes in culture and time. As Johanna Mäkelä, Professor in Food Culture from Helsinki University, has put it in a lecture at Aalto University: »Food culture and food production shows how the world goes round«.[15]

Design also is about understanding human culture. Bringing together Food Culture and Design gives a fine example of joining together perpetual design problems with a current subject.

15 **Mäkelä, Johanna** (2016). *Lecture at Aalto University School of Arts, Design and Architecture* 14.4.2016

Fig. 4 *Table Tools*. Photo: Barbara Schmidt

From a Design point of view, table-top items – for instance cups – represent elementary everyday tools. When a student gets a task to design a coffee cup, he goes back to the very basics: the concrete material, function, shape and structure form together a strict but typical design brief. But that is not the whole package: the material sources and the production technology as well as the market and cultural context form the whole frame of the life of a cup.

FZ I have one last question for you both: what do you think is the future of ceramics?

BS The close relationship between man and ceramics has evolved over several thousands of years and will continue to evolve. The advancement of technical ceramics has gone widely unnoticed – in Germany, it accounts for more than 50% of the ceramics sales. But there will also be new developments in the area of ceramics for food and beverages. Just as there is a small but growing very creative counter-movement to the industrial processing of food, there is also a counter-movement for ceramic vessels and devices that highlights an interest in customised products that appeal to the senses. The focus of this discourse is on ceramic materials, surfaces, and production methods that would not necessarily work in an industrial context, post-industrial if you will, with elements of industry 4.0.

NL I see several ways coming. One is the development of new technologies, such as 3D-printing in clay as well as other more sophisticated printing methods. Those bring new interesting aesthetics and functions that we are not used to seeing in ceramics. Another is ceramic as a media for modern art becoming more popular. The third way is going back to its roots, a search for genuine things. The comeback of tactile senses is a reaction to an increasingly digital world. The fact that the ceramic industry has moved from Europe also gives more value to local small-scale production. I believe all sides will grow in success but they will be created and made by a diminishing bunch of lucky people due to changes in education.

FZ Thank you so much Barbara and Nathalie for metaphorically opening the doors of your design studio and walking us through your design process and your thinking on ceramics and Food Design. Your answers have fascinated me, have triggered thinking, and most importantly have sparked my imagination. I'm sure this was the same for our readers.

Francesca Zampollo *is the founding editor of the* International Journal of Food Design *and the founder of the* International Food Design Society. *Francesca has a PhD in Design Theory applied to Food Design, and she has taught Design Theory and Food Design at London Metropolitan University and Auckland University of Technology. Francesca is the founder of the* Online School of Food Design© *and is an award-winning food designer, often invited to talk about Food Design and Food Design Thinking. Her current project* In Search of Meaningful Food *investigates the emotional aspects of meaningful food.*

Finnish-French ceramist and designer ***Nathalie Lahdenmäki*** *graduated in 1999 from the University of Art and Design Helsinki, from the Department of Ceramics and Glass. She focuses on small-scale production of porcelain tabletop series and works also as a freelance designer for the Finnish ceramics and glass industry, the Iittala and Arabia brands. Since 2002 she has worked as a lecturer at the Aalto University, School of Arts, Design and Architecture, Helsinki. Lahdenmäki's works have been exhibited regularly and she has received several design prizes, such as the Design Plus Award 2002 in Frankfurt Germany and the Bronze Award from Mino Competition 2005 and 2014, Japan. In 2008 she was awarded the Young Designer of the Year in Finland.*

Barbara Schmidt *is a designer based in Berlin. She studied in Halle, Germany and Helsinki, Finland. Since 1991, she has been working for KAHLA/Thüringen Porzellan GmbH, where she has taken on an important role in the redirection of the company. Since 2014, she has been Professor for Experimental Design at Weißensee School of Art, Berlin, Germany. Barbara Schmidt's works have been exhibited regularly and her porcelain collections have received numerous national and international awards including iF, red dot, GOOD DESIGN Chicago and Japan.*

Dirk Hoyer **The Tense Present and the Future Image**

One of the most commonly-used terms for the current political, economic and cultural mindscape is the word »crisis«. Antonio Gramsci during his imprisonment found an adequate description for the 1930s that also resonates with our contemporary era: »the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear«.[1]

A few centuries before, in 1516, another thinker developed his very own variation of processing the crisis: Thomas More wrote his epochal book *Utopia.* Instead of limiting himself to the critique of the existing status quo he opted for a new and innovative way to confront the morbid symptoms: imagining a different society that is not in the hereafter but that can be attained through a redesign of society. His neologism »Utopia« is a word-game that mixed the Ancient Greek words *Eutopia* (good place) and *Outopia* (no place). More's book ignited a wave of utopian thinking (and revolutions) that culminated in the 19th century with the development of utopian socialism. The idea of utopia inspired countless philosophers, political thinkers and artists.

Morris and the Utopia of Art

In the context of 19th century utopian socialism the question of how utopian visions could be articulated in the arts became a prevalent issue. Most utopias, even the early modern ones, acknowledged the importance of art, but until William Morris no utopian thinker explicitly addressed the questions of how ideals about a good society could be implemented in art practice and theory. The Arts and Crafts Movement, and Morris' significant contribution to it, was not just another fashion in the art cycle (although some works were highly valued by art ficionados of the time) but had some deep implications about the role of art and the process of making art. Questions about the role of technology in the process of art making, about the division of labour, about possible alternative social arrangements and the role of art in facilitating a new political understanding were treated as having equal importance with questions about aesthetics.

1 **Gramsci, Antonio** (2005). *Selections from the Prison Notebooks.* New York: International Publishers. (Original work published 1971), p. 276

As Great Britain was at the forefront of a brutal industrialization process, social inequality became a more and more pressing issue. At the core of the problem, according to one of the key inspirations for Morris, John Ruskin, was the unjust division of labour. Ruskin argued in 1853:

... we want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen, in the best sense. As it is, we make both ungentle, the one envying, the other despising, his brother; and the mass of society is made of morbid thinkers and miserable workers.[2]

The outcome of this division of society was not just material inequality but also spiritual impoverishment on both sides of the divide. Morris, who was inspired by the craft-based art-making during the Middle Ages, saw the question of pleasure in labour as a key concern. In *Art and Socialism,* initially published in 1884, he criticized the modern division of labour that separated the craftsmen from the artist. This division had negative consequences for both, for, according to Morris[3], the »artist came out from the handicraftsmen, and left them without hope of elevation, while he himself was left without the help of intelligent, industrious sympathy.« For Morris, socialism and art are profoundly linked, because art disconnected from society is only geared towards commerce, or in Morris' words the »greed of money«. The growing inequality produced by the economic system with the implicit collaboration of the art world is »founded on the art-lacking or unhappy labour of the greater part of men«.[4]

At the very moment that art is disconnected from society, artists become incapable of understanding the foundations of social misery and the majority of the population is alienated from the art world. As Morris[5] underlines: »I do not want art for a few, any more than education for a few, or freedom for a few.« If art does not gain a different foundation, but is inextricably linked to the commercial system, its focus will remain the present, thus

2 **Ruskin, John** (*2004). Selected Writings.* Oxford: Oxford University Press, p. 57
3 **Morris, William** (1947). *On Art and Socialism: Essays and Lectures.* United Kingdom: John Lehmann, p. 22
4 ibid., p. 140
5 ibid., p. 36

leading to the condition of exclusion through competition and the narrow focus on self-interest. Morris[6] argues that »men whose apparent self-interest binds them, consciously or unconsciously, to the present« are »therefore hopeless for the future.« He also strongly criticized the brutal animalistic competition that the economic system is fostering, advocating stronger forms of human association as an alternative modus operandi for society.

Morris successfully implemented his egalitarian ideals, which strongly value co-operation in an environment that is not dominated by a debilitating division of labour, in his decorative arts company, which he referred to as *the Firm.* In this sense, *the Firm* was reflecting the 19th century utopian ethos to implement ideas and not only send people on literary journeys to remote utopian islands or remote utopian times. Although Morris became an influential artist and lived what most 19th century British people would consider a privileged life, his socialist concerns became stronger. Morris[7] sees capitalism as a »terrible organization so strong in itself; so rooted in the self-interest, stupidity, and cowardice of strenuous narrow-minded men; so strong in itself and so much fortified against attack by the surounding anarchy which it has bred.«

As David Leopold writes in his introduction to Morris' classic *News From Nowhere:*

Morris himself, however, always insisted that socialism had saved him from the twin fates which customarily consumed those members of his class which possessed ›artistic perceptions‹: he had neither wasted his time and energy on futile schemes ›to make art grow when it no longer has any root nor had he crystallized into ›a mere railer against ›progress‹.[8]

Thus, in Morris' view, political commitment to equality, a utopian vision, is an important grounding for artistic creation which otherwise might drift into mere self-referentiality or diffuse criticism. Without that compass, art can drift into »narrow cowardly life«.

In *News From Nowhere,* the traveller to a utopian England, William Guest, meets an old man who is one of the few who

6 ibid., p. 139
7 ibid., p. 151
8 **Leopold, David** (2009). *Introduction.* In Morris, W. (2009). News From Nowhere or An Epoch of Rest. Leopold, D. (ed.). Oxford: University Press. (Originally published 1890), IX

remembers how the pre-utopian life was like. This man, Old Hammond, tells Guest that it »is true that in the nineteenth century, when there was so little art and so much talk about it, there was a theory that art and imaginative literature ought to deal with contemporary life, but they never did so…«[9]

So, apart from a focus on contemporary society, and a practical commitment to community instead of fostering division of labour, a rejection of competition, what can actually lead to an improvement of society and of art? Leopold points at the importance of utopian visions in Morris's understanding of art:

Morris identifies several important functions that utopian speculations can still fulfill: they can offer solace amidst the often ›dull and discouraging‹ work of progress; they can lend necessary direction to those pragmatic short-term measures ›which we are likely to attain‹, they can motivate this ›wise‹ activists who need to ›see and feel‹ that any sacrifice is merited; and they can provide a critical vantage point from which to view ›the conditions of life which surround us all today‹. [10]

Long before Ernst Bloch, Morris recognized the importance of a vision that instils hope in transcending the existing state of society, and points at a direction that should help to develop social alternatives, projections of a new society in times of transition. Morris[11] also saw his own time as a time of transition, a time of decadence and corruption, and emphasized that every age »has had its hopes, hopes that look to something beyond the life of the age itself, hopes that try to pierce something into the future«. He hoped for a rebirth of art and for a liberation from the commercial pressure that so strongly limits its scope. In this understanding, art should not be an obstacle for progress but its driving force. The fundamentals for a society based on co-operation are, in Morris's[12] words: »Intelligence enough to conceive, courage enough to will, power enough to compel. If our ideas of a new society are anything more than a dream, these three qualities must animate the due effective majority of the working people…«

9 Morris, William (2009). *News From Nowhere or An Epoch of Rest.* Leopold, D. (ed.). Oxford: Oxford University Press. (Originally published 1890), p. 88
10 Leopold (2009), XXX
11 Morris (1947), p. 279
12 ibid., p. 326

TINA as a Future Image?

It is revealing that many of the writings of Morris appear naïve to many contemporary readers. His optimistic account on the power of intelligence, the courage of will, the power to compel, and his positive account of childlike imagination are at odds with a zeitgeist that is nourished with either conformist or dystopian ideas. The key phrase of the 21st century is: There is no alternative (TINA). While Gramsci was actually imprisoned, many contemporary thinkers have agreed to a voluntary imprisonment of the political imagination.

A spectre is haunting the critics of capitalism world-wide, the spectre of resignation! David Graeber[13] argues that, we »cling to what exists because we can no longer imagine an alternative that wouldn't even be worse«. Russel Jacoby[14] sees the emergence of a new consensus, »There are no Alternatives. This is the Wisdom of our time, an age of political exhaustion and retreat«. Max Haiven and Alex Khasnabish[15] argue that people used to dream big but »such dreams now seemed smothered by the rampant individualism, claustrophobic cynicism and reactionary backlash engendered by neoliberal social engineering and shrill neoconservative moralism«. Frederic Jameson[16] sums up the resignation of the imagination: »Someone once said that it is easier to imagine the end of the world than to imagine the end of capitalism«. For Jacoby[17], the consequence of this political resignation is resignation in the sense that: »a utopian spirit – a sense that the future could transcend the present – has vanished«. And Haiven and Khasnabish[18] add that the crisis has been rendered so banal that rather »than functioning as a rallying cry for collective action, it often serves to obfuscate rather than illuminate, demobilize rather than inspire« and criticize that »the crisis trope encloses our collective imagination of what is possible, narrowing it to focus on the crisis.«

Franco Berardi[19] echoes this by asking: »Should we not free ourselves from the thirst for activism that fed the 20th century to the point of catastrophe and war?« and wonders if a »withdrawal into inactivity, silence, and passive sabotage« might not be the

13 **Graeber, David** (2012). *Debt: the first 5,000 years.* New York: Melville House, p. 382
14 **Jacoby, Russell** (1999). *The End of Utopia: Politics and Culture in an Age of Apathy.* New York: Basic Books, XI
15 **Haiven, Max/Khasnabish, Alex** (2014). *The Radical Imagination: Social Movement Research in the Age of Austerity.* London: Zed Books, p. 30
16 **Jameson, Frederic** (2003). *Future City.* London: New Left Review, p. 76 Retrieved October 20, 2014 from: http://newleftreview.org/II/21/fredric-jameson-future-city
17 **Jacoby** (1999), XI
18 **Haiven/Khasnabish** (2014), p. 31

better option. In fact, Berardi suggests abandoning the future as a concept because of its capitalist origin. His assertion that the will is paralyzed amounts to a capitulation to the status quo and does not contain any possible reanimation of the will. This fatalistic retreat from what is conceived to be an immutable reality forecloses the option of reanimating the collective imagination. Berardi's prescription for the contemporary malaise is likely to worsen the condition. Instead of abandoning the future, its potential should be acknowledged.

In the 1960s, F.L. Polak argued that a dominant image of the future is needed in order to dynamically shape the present. Polak writes:

If Western man now stops thinking and dreaming the materials of new images of the future and attempts to shut himself up in the present, out of longing for security and for fear of the future, his civilization will come to an end. He has no choice but to dream or to die, condemning the whole of Western society to die with him.[20]

While the need to conserve Western society might not be such an essential concern, the need to conserve or reanimate the idea of society is crucial in today's context. What Polak understood is that images can have a mobilizing aspect and the absence of images leads to the paralysis of the will that Berardi described.

Even on the highest level of scientific inquiry, an understanding and shaping of the future was then considered to be an important task. Bertrand de Jouvenel[21], ironically on the conservative side of the political spectrum, advocated what he called »Futuribles« a scientific inquiry, a »dynamic theory« as he called it, about the »possible futures« which can be shaped in which the outcome could be moulded according to intervening actions.

The aim of such a dynamic theory is »to generate a habit, the habit of forward looking«[22]. Jouvenel sees the necessity of discussing assumptions of the future because »all our decisions imply some assumptions about the future: if not made explicit, we do not criticize them.« As he underlines, this is not the realm of the ›true and false‹ but the realm of ›possibles‹ and while there

19 **Berardi, Franco** (2011). *After the Future*. Genosko, G. & Thoburn, N. (eds.). Oakland, CA: AK Press, p.9

20 **Polak, Fred** L. (1961). *The Image of the Future*. Amsterdam: Elsevier Scientific Publishing, p. 53. Retrieved June 29, 2016 from: http://en.laprospective.fr/dyn/anglais/memoire/the-image-ofthe-future.pdf

21 **de Jouvenel, Bertrand** (1965). *Futuribles*. Retrieved January 15, 2015 from: http://www.rand.org/content/dam/rand/pubs/papers/2008/P3045.pdf

could not be a science of the future, it still needed to be reflected upon, not in an implicit but in an explicit way. This »work of imagination« might be seen by some scientist as unscholarly because there are no facts in the future, but Jouvenel[23] points out that »Cicero quite rightly contrasted the expressions *facta et futura: facta* is what is accomplished and can be taken as solid, and *futura* is what shall come into being and is as yet ›undone‹, fluid.«

So an exclusive focus on the *facta* narrows down the possibility of the *futura*. This becomes even more problematic if, as Jouvenel[24] already observed in the 1960s, »the rapidity of change implies that our present knowledge of the environment has a short validity«. In a context of accelerated change, the fact generation is becoming even more precarious and the only remedy for this epistemological dead end is speculation. So Jouvenel encouraged scientists to create pictures of future situations and to develop reasoned conjectures.

The optimism of Jouvenel and the pessimism of Berardi are the two poles between which any reflection of the future can be placed. De Jouvenel praised the kinetic energy of the French Revolution and advocated for a more dynamic mindset. When it comes to the question of political agency, de Jouvenel's realm of *possibles* has far greater potential for changing the existing framework than Beradi's *passive sabotage.*

Immanuel Wallerstein (1998) developed a hybrid between historical determinism and individual or collective agency. In the context of his world systems theory, Wallerstein explains that the capitalist world economy (which started roughly at the time when More wrote Utopia) is coming to an end and that we are living in a time of transition to a yet unknown new world system. In these times of transitional TimeSpace, or points of bifurcation as Wallerstein calls them, the influence of the free will factor is far higher than in the times of the ongoing life of the world system. For Wallerstein, the French and the Russian Revolution ultimately did not result in any world historical change because they happened at the wrong moment, when the world system was not yet at the point of transition. Wallerstein explains that:

22 ibid., p. 1
23 ibid.
24 ibid.

... when systems are functioning normally, structural determinism outweighs individual and group free will. But in times of crisis and transition, the free will factor becomes central. The world of 2050 will be what we make it. This leaves full rein for our agency, for our commitment, and for our moral judgment. It also means that this period will be a time of terrible political struggle, because the stakes are much higher than in so-called normal times.[25]

The Contemporary Idiot

If Wallerstein's analysis of transitional TimeSpace is correct, then the mainstream reaction to this historical window of opportunity is highly bizarre: retreat into political passivity or reactionary defence instincts. The first attitude can be described as »idiocy« in the sense that Hannah Arendt defined the word:

Not only would we not agree with the Greeks that a life spent in privacy on »one's own« (idion), outside of the world of the common, is »idiotic« by definition, or with the Romans to whom privacy offered but a temporary refuge from the business of the res publica; we call private today a sphere of intimacy ... whose peculiar manifoldness and variety were certainly unknown to any period prior to the modern age.[26]

The retreat into the private and intimate sphere has become a permanent refuge for many citizens in what Daniel T. Rodgers[27] calls the *age of fracture.* Peter Thompson[28] warns of a *privatization of hope.* The vanishing hope for solutions in the political sphere, the decline of the public sphere and the self-fulfilling prophecy of the homo economicus have fuelled the retreat into a rationality based on self-interest. The *idiot,* in the Arendt sense, is the dominating figure in most of the Western countries. Boris Buden[29] described the privatization of hope, stating that »it is hope without society (Gesellschaftslosigkeit der Hoffnung) not the society without hope (Hoffnungslosigkeit der Gesellschaft)« that is the defining feature of contemporary existence.

The void in the public sphere is filled with post-democratic politics or, with a growing amount of citizens that are attracted by

25 **Wallerstein, Immanuel** (1998). *Utopistics. Or, Historical Choices of the Twenty-first Century.* New York: The New Press, p. 64

26 **Arendt, Hannah** (1998). *The Human Condition* (2nd ed.). Chicago: The University of Chicago Press. (Original work published 1958), p. 38

27 **Rodgers, Daniel T.** (2011). *Age of Fracture.* Cambridge, MA: The Belknap Press of Harvard University Press

28 **Thompson, Peter & Žižek, Slavoj** (eds). (2013). *The Privatization of Hope: Ernst Bloch and the Future of Utopia.* Durham: Duke University Press

groups for whom the world radical does not mean going to the root of the problem but to simplify the problems and accordingly the solutions. Creagh.[30] This recalls Proudhon's definition of *idéomanes*:

The most dangerous of them are, perhaps, those people whom Proudhon calls »idéomanes«, individuals imprisoned in the bubble of their ideas (…) They sacrifice their lives, their desires, their aspirations and their families to »the Cause«, and if they go so far as to mould themselves in those trends that seem to carry their ideas, they may even mutate into monsters. The idéomanes are blinkered, their ideas are an obstacle to the analysis of their own subjective reality and hold them back from the theoretical exploration of the infinity of possibles.[31]

The growing polarization of European societies and the recent developments, for example in France (terrorism, the rise of the Front National), show that with *idéomanes* a political discussion is impossible. And even if some of the movements might disintegrate, the overall rise of fundamentalism (religious or political) is in proportional relationship to the rise of *idiots* who have retreated into their privacy. Both phenomena, the *idéomane* and the *idiot,* have disconnected themselves from the analysis of their own subjective reality and severed their link to society, and thus fortified their positions in fundamentalist delusion or enclosed themselves in their private bubble. Both versions represent a narrowing down of possible alternatives and ultimately cement the status quo that the *idéomane* and the *idiot* actually want to escape from.

The desire for change is growing and has manifested itself in protest movements such as the *Indignados, Occupy* or *Nuit Debout* and on the opposite side of the political spectrum in the *Tea Party* or the European right-wing populism. The question is: why have the movements on the left disintegrated so quickly while the movements on the right have been integrated into the political decision making process? The *Tea Party* and its European spiritual cousins are articulating some form of a glorification of

29 **Buden, Boris** (2009). *Zone des Übergangs: Vom Ende des Postkommunismus.* Frankfurt a.M.: Suhrkamp, p. 169
30 **Creagh, Ronald** (2007). *Anarchism is Back: We May Now Re(dis)cover Utopia.* Spaces of Utopia: Electronic Journal 6, pp. 61–83. Retrieved June 10, 2016 from: http://ler.letras.up.pt/uploads/ficheiros/4343.pdf
31 **Creagh** (2007), p. 74

the (lost) past, which according to Goodwin and Taylor[32] »renders the thinker impotent with respect to both present or future«. So their agenda of change has no emancipatory potential for the future. On the left, the absence of a future image and possibly the too sporadic forms of protest have led to a quick disintegration of the movements and the potential of agency along with it. Without a clear conceptualization (that remains flexible enough to be adjusted to changes in the social construct called society) of the possible, without an articulation of utopian mental images, political agency will ultimately vaporize and revert to criticism and cynicism.

Vision and Vorstellungskraft

The importance of a vision of the future seems to be a banality but, increasingly, the scope of vision has shifted to the rear view mirror, the language has become more diffused and there is a sense of discomfort when articulating visions. Being a dreamer has a more and more negative connotation in a world that proudly wears narrow pragmatism on its flag. But, as Moritz Kaufmann[33] has pointed out, »here we see the value of utopias, in that they hold up a higher ideal of society and prevent a stationary or rather stagnant condition of humanity, satisfied with the base facts of life.« These words by Kaufmann are now like an odd echo of the 19th century. In the more moderate 21st century version, the idea is expressed as the following: »Without visions of how the world might be different, struggles stagnate and decline«[34]. Or in the words of David Graeber[35]: »Still, if there is anything that the last several hundred years of world history have shown, it's that utopian visions can be powerful.« For Graeber, the examples of Adam Smith, the father of modern economics, Jeremy Bentham, the founder of modern utilitarianism, or the French Revolution show the transformative force of ideas.

In order to develop visions in an environment where, for many people, alternatives to the status quo are inconceivable, the imagination needs to be animated. But imagination as a concept is too general, and does not contain a specific direction. According

32 **Goodwin, Barbara / Taylor, Keith** (1981). *The Politics of Utopia: A Study in Theory and Practice.* London: Hutchinson & Co, p. 23
33 **Kaufmann, Moritz** (1879). *Utopias.* London: Kagan Paul, p. 139
34 **Haiven / Khasnabish** (2014), p. 63
35 **Graeber, David** (2012). *Debt: the first 5,000 years.* New York: Melville House, p. 354

to the dictionary used for writing this article[36] the English word »imagination« has ten translations in German: Fantasie, Einbildung, Einbildungskraft, Vorstellung, Einfallsreichtum, Ideenreichtum, Imagination, Vorstellungsgabe, Vorstellungskraft, Vorstellungsvermögen. While words like Fantasie or Einbildung refer to the non-existent, Ideen- or Einfallsreichtum refer to the amount of ideas and Imagination has a visual connotation. The concepts related to Vorstellung are closest to the kind of imagination that is needed in terms of a new utopian thinking. Vorstellung literally means »putting something in front of something else« (or »placing something else in front of the existing«), but has also connotations like »idea«, »conception«, »vision«, »belief« and »image«. Vorstellungsgabe and Vorstellungsvermögen refer to the skill to imagine, Vorstellungskraft refers to the »strength«, »energy«, »agency« and »potency« to imagine. So *Vorstellungskraft,* the tenth translation of »imagination« is not retranslatable into English, but it actually means the strength, energy, agency and potency to »place something else in front the existing«, to develop ideas, conceptions, visions, beliefs and images. In this all-encompassing complexity, *Vorstellungskraft* is the kind of imagination that is needed in order to develop new visions. All of the following English quotes should be understood in this wider understanding instead of the very reductive, ill-defined and unimaginative term »imagination«.

Robert T. Tally Jr. recalls the old 1968 slogan »power to the imagination« and proposes a reconsideration of the role of imagination:

Perhaps it seems overly optimistic or even naïve, but the idea of imagination as a revolutionary force retains value in a world in which real alternatives to the status quo are taken to be, not just impossible, but unimaginable.[37]

Tally Jr.[38] sees scientific realism as a »non-imaginative representation of reality« that »may produce an accurate portrait of a very limited field, the imagination makes possible a more comprehensive, and therefore more ›realistic‹ representation.«

36 source: leo.org
37 **Tally Jr, Robert T.** (2010). *Sartre, Marcuse, and the Utopian Project Today.* CLCWeb: Comparative Literature and Culture, 12 (1), p. 3. Retrieved from: http://dx.doi.org/10.7771/1481-4374.1572
38 ibid., p. 6

In this interpretation, realism without imagination is impossible and merely leads to a limited understanding. In the same vein, Ronald Creagh[39] locates Utopia »at the crossroads between the actual world and collective imagination. It questions nothing less than a world vision, because it is a query about reality.« Creagh thus sees Utopia as being in direct tension between the actual world and imagination that has the potential to redefine reality. To this, he adds one important element: the collective dimension.

Imagination reduced to the individual is like privatized hope. As Hannah Arendt[40] observes, the »only thing people have in common is their private interests« and as a consequence »both the public and private spheres of life are gone, the public because it has become a function of the private and the private because it has become the only common concern left.« For the imagination, that means the same as Werner Heisenberg[41] states about science: »For the first time in history man encounters on this earth only himself«. Mark Fisher[42] quotes a similar idea by Adam Curtis: »In a world of individualism everyone is trapped within their own feelings, trapped within their own imaginations.« This individualism trap for the imagination is fortified by the fact that it becomes more and more difficult to relate to other people, or as Berardi[43] calls it, the »faculties of conjunction« are dulled by the process of cognitive reformatting and as a consequence individuals are on a »passage from a conjunctive to a connective form of human concatenation.« Berardi clarifies that conjunction »is becoming-other. In contrast, in connection each element remains distinct and interacts only functionally.«

In this context, the idea of collective imagination has a strange connotation, because the immediate functionality of this connection is not visible. The motivation of being mobilized for an idea outside of the immediate self-interest is at first more difficult to comprehend. Rodgers[44] writes that »in the course of those shifts of ideas and imagination, the webs of dependence and connection that joined the disaggregated selves had become far harder to articulate.« Again, the consequence is connection instead of conjunction and private imagination instead of collec-

39 Creagh (2007), p. 61
40 Arendt (1958), p. 69
41 Heisenberg, Werner (1956). *Das Naturbild der heutigen Physik.* Hamburg: Rowohlt, p. 17
42 Fisher, Mark (2009). *Capitalist Realism. Is There No Alternative?* Winchester, UK: O Books, p. 74
43 Berardi (2011), p. 30

tive imagination. The imagination and sense of a shared interest (that is not only the sum of private interests) are seriously weakened, which ultimately just strengthens the status quo that has an interest in promoting this fracture. The consequence of this has pointed out by Tally Jr.[45], who claims that »it is frequently impossible to gain a clear picture of the status quo itself, never mind its putative alternatives. Again, the imagination itself must be empowered in such a system.«

David Graeber[46] sees an urgency to develop new forms of imagination, especially since the financial crisis of 2008 and criticizes that »it's almost impossible for anyone to imagine anything else. The war against the imagination is the only one the capitalists have actually managed to win.« The war against the imagination is for Graeber the establishment of a successful narrative that there is no alternative, the idea that the current social organization is the only possible solution. But, he remarks, »total systems don't really exist, they're just stories we tell ourselves, and the fact that capital is dominant now does not mean that it will always be«.

When Graeber writes about imagination he refers to a meaning of the word that is pre-Cartesian because it is »only after Descartes, really, that the word ›imaginary‹ came to mean, specifically, anything that is not real.« Before Descartes, before the »transcendent notion of imagination«, in the common Ancient and Medieval conception, in Graeber's interpretation the imagination was an intermediary between reality and reason. Graeber advocates a return to this pre-Cartesian understanding of imagination. He writes:

... the kind of imagination I have been referring to here is much closer to the old, immanent conception. Critically, it is in no sense static and free-floating, but entirely caught up in projects of action that aim to have real effects on the real world, and as such, always changing and adapting.[47]

Imagination and action are thus connected. In this passage between reality and reason, the imagination has the crucial role of

44 Rodgers (2011), p. 271
45 Tally Jr. (2010), p. 5
46 Graeber, David (2011). *Revolutions in Reverse. Essays on Politics, Violence, Art and Imagination.* New York: Minor Compositions, p. 113

actively shaping the understanding of reality and ensuring that reason produces an active response that enables action on reality. As reality is collective reality, an enclosing of imagination to the private imagination would inevitably reduce the understanding of reality and limit the possibilities of action.

The importance of collective imagination is highlighted in the concept of radical imagination by Haiven and Khasnabish. Radical imagination is defined as an aspirational term which aims at imagining »the world, life and social institutions« with the explicit recognition the world is changeable and should be altered. Haiven and Khasnabish underline that:

… the radical imagination is not just about dreaming about different futures. It's about bringing those possible futures ›back‹ to work on the present, to inspire action and new forms of solidarity today. Likewise, the radical imagination is about drawing on the past, telling different stories about how the world came to be the way it is.[48]

According to Haiven and Khasnabish, the focus of radical imagination is to imagine and make common cause with the experiences of other people and to build solidarity across boundaries and borders, real or imagined, with the explicit intention of undermining the existing power structures. The collective dimension is thus not only an ethical dimension but also has the dimension of enlarging the scope, as Haiven and Khasnabish explain:

… we understand the imagination as not merely the ›private property‹ of the individual. Through shared experiences, language, stories, ideas, art and theory we share part of our imagination. We create, with those around us, multiple, overlapping, contradictory and coexistent imaginary landscapes, horizons of common possibility and shared understanding.[49]

Thus, solidarity and imagination are intertwined in the form of a »shared landscape and a common resource that both informs our actions and relationships and is, in turn, shaped by our actions and relationships«.[50] So, in radical imagination the creative

47 ibid., p. 53
48 **Haiven/Khasnabish** (2014), p. 3
49 ibid., p. 3
50 ibid., p. 226

force of the individual is enhanced through the creation of shared imaginaries.

To come back to the initial redefinition of imagination as *Vorstellungskraft*, as the strength, energy, agency and potency to *place something else in front of the existing,* to develop ideas, conceptions, visions, beliefs and images, the understanding can be now expanded. If *Vorstellungskraft* is understood as the passage from reality to reason, then its energy can be used not only to merely place something in front of the existing, but to alter it. Not only in the sense of developing a different reason but also to create a different reality. If the *Vorstellungskraft* is then also understood as *shared imaginaries,* and thereby a collective dimension is added to it, then the concept becomes politically charged as a means to collective agency.

In this reinterpretation, *Vorstellungskraft* means the strength of collective agency to project a new understanding on the status quo with the explicit aim of altering it. This redefinition does not mean a functional reduction of the idea of imagination but a re-establishment of the link between reality, imagination and reason in order to counter the narrowing down of imagination through its private enclosure. Individual imagination is primordial, but in order to re-establish its freedom and widen its scope, *Vorstellungskraft* has the potential to escape the mental prison of TINA, to stimulate political action and as a consequence also revive art. Vorstellungskraft can open a way out of the tense present into a future image.

Dirk Hoyer *is the author of »(ap)art Contemporary Art and Utopia« (Helsinki: Aalto Arts Books, 2015). This monograph, Hoyer's doctoral dissertation, is part of the artistic research project on the role of utopia in contemporary art and culture which also resulted in the documentary film »(ap)art«. The film was shown at the Research Pavilion of the Venice Biennale 2015. He holds a Doctor of Arts from the Aalto University School of Arts, Design and Architecture in Helsinki, Finland.*

Flemming Tvede Hansen and Priska Falin

3D Printing as a Ceramic Craft Tool in Its Own Right

In April 2016, four universities met for one week at the KAHLA Porcelain factory to discuss the future of ceramics and, through workshops, explore the theme »shaping the future«. One of the workshops was focusing on 3D printing in clay and the concept of *material driven 3D printing in clay.* This article reports from and reflects on the experiments and discussions in this workshop and concentrates on 3D printing in clay from the perspective of studio practice in art and design. The main point of interest is in examining how a technology such as 3D printing can be utilised and seen as a new ceramic craft tool in its own right and how 3D printed ceramics can also be considered as handmade objects.

As a part of the bigger project, *Ceramics and its Dimensions,* the module *Shaping the Future* is concentrating on exploring the future dimensions of ceramics in Europe. With the future in mind, the module conducted a student workshop with four partner Universities: Aalto University, Helsinki, Berlin Kunsthochschule Weißensee, Ulster University, Belfast campus and The Royal Danish Academy of Fine Arts, School of Design, Copenhagen. The module's outcomes are being exhibited in a touring exhibition and a catalogue over the period 2016 to 2018. The exhibition shows the works that were initiated in the workshop at the KAHLA Porcelain factory and the final works curated from an open call for entries for the 4 partner Universities.

For making ceramics, the skills of the maker and the practitioner's tools are a central part of what can be realised. The development of new tools has pushed the potential for ceramics and the possibility for new shapes, purposes, and functions. The development of technologies has raised questions about the quality of the products concerned regarding those handmade versus those machine-made. The international Arts and Crafts movement of the nineteenth century is an example that initiated justified scepticism of the machine and prized the work made by hand. Nevertheless, the craft has expanded through technology and new tools, the potter's wheel for instance. The potter's wheel was at one point a new technology, but a thrown pot is

today considered handmade.[1] In this article, we will discuss and show how a ceramic object produced by a new technology such as 3D printing, which can also be met with scepticism of the machine, can be considered as a craft.

Today, 3D printing is a rapidly growing technology in many different fields, and the material spectrum is growing with it as the technology becomes more affordable for common users. Clay is one of the materials suitable for printing purposes. Although the 3D printing technique is already well known all around the world, 3D printing with clay is still relatively unexplored throughout the different fields.

»As easy as pushing a button« Johnson[2] describes 3D printing or rather the mental image of the process. Compared to the processes in the making of ceramics, this sounds like the complete opposite in experience. The enjoyment of the making and understanding of the material properties are deeply connected to the experiences of the making processes. How will a craftsman engage with the making processes of 3D printing technology?

3D printing can be explored and modified in many different ways. In this article, we differentiate between two approaches in the field of ceramics. One approach is grounded in the complex modelling of the digital form by the use of advanced software or programming, and the other approach is grounded in the potential of the material to unfold at the very moment of 3D printing. It is the latter approach that draws our interest, since it pays special attention to materiality and builds on a high level of tacit knowledge and haptic skills from the field of ceramics. We have named this latter approach *material-driven 3D printing in clay.*

Crafting and technology

Following Katie Bunnell[3], craft is something that involves human interaction with technology whether it is a pen, hammer, or computer software and hardware. In the experience of the maker, it involves a high level of autonomous control over a holistic process of designing through making[4]. According to well-known British studio potter Bernard Leach's[5] philosophy, crafting and

1 **Zilber, Emily** (2015). *Crafted: Objects in Flux.* MFA Publications, Museum of Fine Arts, Boston
2 **Johnson, Bobbie** (2011). *3D Printing. New Scientist.* 5/14/2011, Vol. 210 Issue 2812, pp. 32–33
3 **Bunnel, Katie** (2004). *Craft and digital technology.* Keynote speech at the World Crafts Council 40th Anniversary Conference in Metsovo, Greece
4 ibid.
5 **Leach, Bernard** (1940). *A Potter's Book.* London: Faber & Faber

execution can additionally be seen as a unity that is intuitive and humanistic, and as experiential knowledge based on the direct physical and tactile interaction with a responding material[6], an immediate interface to matter which is able to provide instant feedback.

There exists an attitude when comparing the processes of hand-making and computer-based practice that the digital realm is alienating our embodied experiences from the material world. There is a fear that the knowledge, or ›knowing‹, that traditional craftsmen have from making could be lost if digitalisation takes over. Digitalisation is seen as creating a distance between humans and the physical world[7]. However, technology, a concept including digital tools, has an origin dating back to modern humans, when they started to use and invent tools[8]. The notion that 3D printing as a technique distances the maker from the material world is reversed when one thinks of it as one tool among others. That said, 3D printing has the potential to make a greater impact on ceramics than just another tool in the studio. It can make an impact on the philosophy in design, production, and consumption.[9]

The question about machine and craft can be understood as belonging for the contemporary artisan-craftsman[10]. As Sennett puts it: *Is it a friendly tool or an enemy replacing work of the human hand?*[11]. On the other hand, digitalisation has gone so far that there seems to be a request for understanding the creativity present in the computer-based practice[12]. Arguing from a practitioner's point of view, the creativity is still heavily based on the experiences of material practices even if the practice is taking another form in a digital space. With ceramic materials, it is not a straightforward case of designing a form and pressing a button in order to produce the form, a lot can happen during the 3D printing process (as can happen in traditional processes) that influence the outcome. It is still up to the maker to master the process of making to be able to use the tool appropriately. With the tool, there is also a skill required to be able to use it appropriately. Following McCullough (1998)[13], there is a close

6 Dormer, Peter (1994). *The Art of the Maker.* London: Thames and Hudson Ltd
7 Most, Henrik (2005). *On Craft as A Boundary Wrecking Ball.* In: Jönsson, Love (ed.) Craft in Dialogue. Six views on a practice in change. Stockholm: Craft in Dialogue / IASPIS, p. 13
8 Norman, Donald A. (1993). *Things that make us Smart. Defending human attributes in the age of the machine.* Massachusetts: Addison-Wesley, p. 7
9 Özgündogdu, A. Feyza Çakir (2015). *3D printing as a forming method.* Ceramics Technical 40, p. 14
10 Sennett, Richard (2008). *The Craftsman.* London: Penguin Books, p. 81
11 ibid.
12 see more: **Urquhart, Robert** (2016). *Silicon Valley versus Creativity.* Elephant, The Art Culture Magazine. Issue 26, 46–53
13 Mccullough, Malcolm (1998). *Abstracting Craft. The Practiced Digital Hand.* Chicago: MIT Press

connection between digital work and craft practice, where tacit knowledge[14] is involved.

To the traditional idea of a craftsman, Richard Sennett[15] adds the notion that programming can also be thought a craft[16]. The open source ideology in computer software represents a similar attitude to that which traditional crafts have when thinking of passing knowledge from masters to apprentice, but in a community the way of sharing and developing works together. 3D printing, for personal use, has embraced this kind of sharing approach.[17]

Thinking of Ceramics as a Craft and the Art of Ceramics as a highly developed skill of the maker, we believe that the value lies in the close connection of engaging with the material processes and consuming time over repeated processes of making, using our bodies as one element with the production process. With this kind of understanding of making, we find close connections in ceramic practice to Eugen Herrigel's book: Zen and The Art of Archery[18]. In his book, Herrigel, a German Professor of Philosophy, describes in detail the practice of archery from the Japanese tradition where it is considered a form of art that is practised to reach a level of harmony between the conscious and the unconscious[19]. In this notion of the conscious and unconscious working together, the skill of a practitioner is revealed. Comparing this kind of skill to those skills ascribed to the digital-based practices, it is understandable that questions concerning what may be lost when changing from traditional practices to more digital-based ones are raised. However, the question should not be ›what are we losing?‹, but ›what is there to gain?‹

The digital world has it limits when it comes to experiencing materials, but there is an advantage in shifting the mindset into the digital world that opens a ›material free‹ space. In the digital realm, the sketching, planning, designing, and modelling have more distance than the hands-on experience with the material, and this can provide a new perspective that can lead to new ways of handling and thinking of the ceramic material.

This new technology forces one to question the act of making it self. What is different and how is this line of production changing

14 **Polanyi, Michael** (1974). *Personal Knowledge: Towards a Post-Critical Philosophy.* Chicago: The University of Chicago Press

15 **Sennett** (2008)

16 ibid., p. 23

17 **Evans, Brian** (2012). *Practical 3D Printers. The Science and Art of 3D Printing.* New York: Apress, xxv

18 **Herrigel, Eugen** (1992). *ZEN ja jousella ampumisen taito* [Zen in der Kunst des Bogenschiessens]. Bern/München: Esoterica Publishing

19 see also: **Suzuki, Daisetz T.** (1992). *Johdanto* [Forewords]. In: Herrigel, Eugen Zen ja jousella ampumisen taito [Zen in der Kunst des Bogenschiessens]. Bern/München: Esoterica Publishing, p. 5 [Original text 1953]

the traditional ways? As a new tool, the 3D printer stimulates the practitioner's mind to focus on the changes that it can provide.[20]

In the students' workshop at KAHLA the atmosphere was not a dichotomy of two different lines of practices divided into digital and traditional, but an exploration of different techniques with ceramic materials. It was clear that students with different backgrounds and interests were focused on different aspects, whether it was the techniques, materials or something else. For some of the students, the 3D printing techniques were clearly something they wanted to focus on.

3D printing in clay

3D printing technology is, in brief, a process of making three-dimensional physical objects from a digital file. 3D printing covers a wide field of techniques, but the techniques in question are the layer printing techniques where the printing is based on coiling up the shape layer by layer. The technology has been used for a long time within the industry, for example for making prototypes, but in recent years it has also become more popular in personal use.[21]

3D printing for personal use by artists, designers, and craftspeople has been especially pushed by Adrian Bowyer's concept of the RepRap (replicating rapid prototyper) project that started around 2006. A simple open source 3D printer based on parts that either easily could be bought in local hardware stores or printed by the machine itself. Bowyer shared his plan, technical specifications, software and files in the public domain and the population of 3D printers rapidly developed. Further, the 3D printers were improved and new modifications shared based on Bowyer's idea of the public community at reprap.org.[22]

The most common material for 3D printers is plastic and ceramics practitioners have to modify the technique for the clay material. This means that using 3D printing for clay calls for understanding the ceramics practice and materials. The development of a RepRap printer for printing in clay was based partly on the

20 Sennett (2008), p. 210
21 Evans (2012)
22 Warnier, Claire/Verbruggen, Dries/Ehmann, Sven/Klanten, Robert (2014). *Printing Things: Visions and Essentials for 3D Printing*. Berlin: Die Gestalten Verlag

initiative by Adrian Bowyer. Pioneers in this area are the works of the design duo Unfold from Belgium followed by the British ceramicist Jonathan Keep.

Unfold explores the changing role of a designer focusing on a current time when design and manufacturing become more digitised. Since 2009 they have run the Design Studio Unfold's Digital Manufacturing and Ceramic 3D Printing Blog.[23] They have also generously shared their development of 3D printing in the field of ceramics.

Potter and artist Jonathan Keep uses the pot in his art to communicate thoughts, emotions and concerns and has shared very detailed DIY instructions on his website for making a personal 3D printer for clay.[24] Through computer aided designing and 3D printing in clay, Keep has focused even more closely on different aspects of the pot. In his artist statement, he emphasises the human experience and his desire to use the object to express and to communicate.[25]

Material driven 3D printing in clay

3D printing can be explored and modified in many different ways, but for the purpose of this article 3D printing in clay can be seen as a process in two steps. The first step is about designing a virtual 3D shape by software or programming. The second step is the actual process of printing a 3D physical object based on the virtual 3D shape. The whole process can be seen as being grounded in either the first or the second step.

Being grounded in the first step, which is probably the most common approach regarding 3D printing in general, means a focus upon the process of designing the virtual model in the ›material free‹ space. Here, the physical printed model is intentionally meant to be as similar as possible to the virtual model and typically based on advanced use of software or a high level of programming.

Being grounded in the second step, which has our special interest, means an approach focusing upon the potential of the material to unfold. Here, the virtual model can be seen solely as

23 **Unfold** (2014). *Design Studio Unfold's Digital Manufacturing and Ceramic 3d Printing Blog.* Retrieved 2.7.2016 from: http://unfoldfab.blogspot.fi/

24 **Keep, Jonathan.** *Make your own 3D Delta printer for ceramic.* Retrieved 2.7.2016 from: http://www.keep-art.co.uk/Self_build.html

25 see more: **Keep, Jonathan.** *Artist Statement.* Retrieved 2.7.2016 from: http://www.keep-art.co.uk/resume_statements.htm

a scaffold for the material to be unfolded in numerous ways, depending on materiality and the way the printer is used as a tool.

Nevertheless, we see both approaches as crafting. When grounded in the first step, we firstly follow Katie Bunnell's[26] idea about craft as something that involves human interaction with technology whether it is a pen, hammer, or computer software and hardware, and secondly Sennett's[27] idea of 3D printing as an open source ideology in computer software that represents a similar attitude to traditional crafts, and as Sennett puts it, it being *a friendly tool.*

Being grounded in the second step draws our special interest since it pays a special attention to materiality. The ceramic craftsman can here draw and build on a high level of tacit knowledge and haptic skills from earlier practice in the field and express himself through and with the material. We understand this approach as being based on the concept of a direct physical and tactile interaction with a responding material,[28] and crafting and execution as a unity that is intuitive and humanistic.[29] Within this approach, the 3D printer is utilised as a ceramic craft tool in its own right. Here, the material can ›have a say‹ and be seen as a partner in the process of giving form at the very moment of printing. It is the interest of materiality that drives the process of making. Thus, we will for this purpose call this approach for *material driven 3D printing in clay.* In this approach, the final result does not have to look like or refer to the virtual model as long as it has worked as a frame for unfolding the material.

Within the concept of *material driven 3D printing in clay,* there is a focus on hardware rather than programming. A simpler basic knowledge of the 3D software has the potential to create the scaffold for utilising the 3D print, but certainly based on a high level of tacit knowledge and haptic skills rather than merely programming skills. It was with this latter approach and intention that we explored the 3D printing in clay at the workshop at KAHLA.

26 **Bunnell** (2004)
27 **Sennett** (2008)
28 **Dormer** (1994)
29 **Leach** (1940)

The workshop at the KAHLA Porcelain factory

At the workshop at the KAHLA Porcelain factory, there were a total of 20 students with different backgrounds working together with the techniques provided and envisioning the possible future of ceramics. For some of the students, the 3D printing technique was already familiar while for others it was as yet unseen.

For the students, the factory production lines and products were available, along with a few 3D printers in the workshop. The given setting promoted exploring and combining the different techniques. One of the results was to personalise the mass produced objects by continuing the forms with 3D printing or ›repairing‹ the mistakes and patching the gaps.

During the first day at the KAHLA Porcelain factory, Flemming Tvede Hansen gave a demonstration on how one can be creative with the printing process and by printing directly on the casted unfired factory object how one can have a hands-on approach to the printing process. The demonstration aimed firstly to introduce the concept of *material driven 3D printing in clay* and secondly the idea of 3D printing as a tool for combining industrially mass-produced ware with a one-off-touch by printing directly on freshly slip cast objects from the production at the factory.

Demonstration of material driven 3D printing in clay

The concept of *material driven 3D printing in clay* was initially demonstrated by printing a simple cylinder several times but in different ways in order to explore the aesthetic expression of the layering on the surface. This can, for example, be explored through different distances between the layering according to the settings in the printer software or by the pressure levels of how much clay is extruded over time. However, it can also be explored by intervening at the very moment of printing by changing the height of the print-head or repositioning the object by hand throughout the print time. The result of a change in the distance between the print layer of the same cylinder is exemplified by the difference in the students' work (Figures 1 and 2). In Figure 3, change in the height has been explored within the same object.

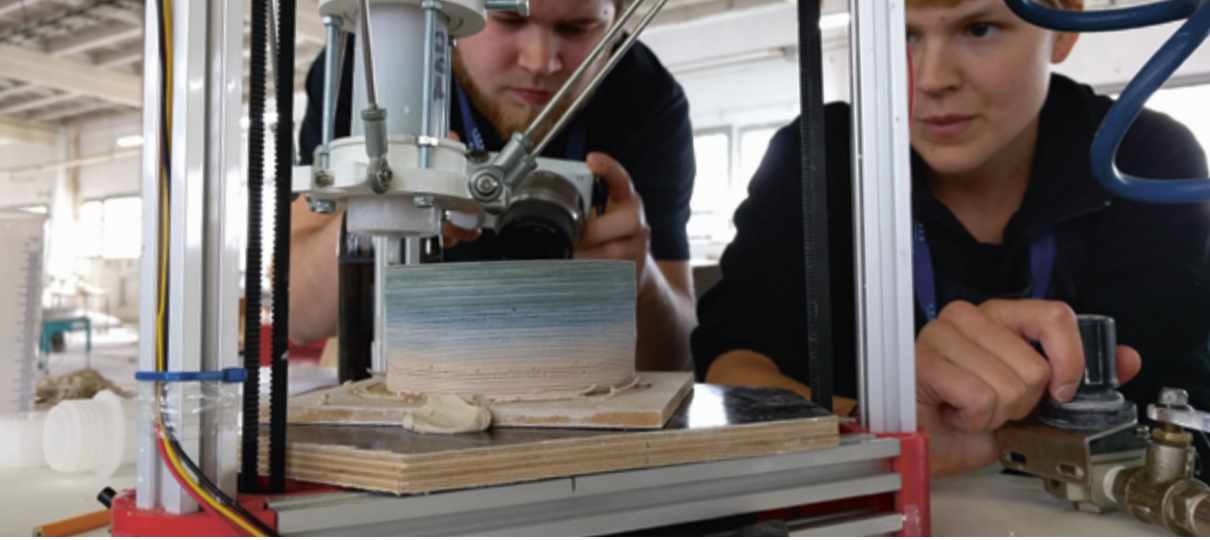


Fig. 1 Controlling the pressure while printing makes it possible to change the size and expression of the coiling. Photo: Yaara Rabinovitz

In these examples, 3D printing is explored by allowing the materials to ›have a say‹ and by investigating the technique's potential for ornamentation and decoration. Conducting a process and interfering in a process can give different results. One benefit that 3D printing offers for the practitioner is that she is able to have a hands-on approach to an ongoing process.

Mass-produced ware with a one-off touch

The idea of combining the industrially mass-produced ware at the KAHLA Porcelain factory with a one-off touch was introduced by 3D printing directly on freshly slip cast objects. The overall idea was here to explore the concept of *material driven 3D printing in clay* as an approach for utilising the 3D printer as a tool for adding a one-off touch to the mass-produced ware from the factory by printing directly on freshly slip cast objects. In the context of industrial mass-production, this idea can historically be related to small classic series of hand painted mass-produced ware or hand modelled flower decoration on dinner service.

This idea was first introduced in the workshop as a decorative

effect by printing directly on the lid of a sugar bowl (Figure 4) and then by replacing a handle on a cup with a 3D printed handle (Figure 5). Here, simple geometries were artistically unfolded on and in interplay with the mass-produced ware. Through simple and playful interventions, such as different heights of the printhead, different positions of the object or printer settings, the 3D printed parts can easily vary and thus add a hands-on and one-off touch to mass produced objects.

These demonstrations were first opened up for periods of brainstorming through practical experimentations in groups of students mixed from the four universities. Secondly, the demonstrations and suggestions functioned as inspiration for the students for further work and the final call for the travelling exhibition.

For some of the students, 3D printing as a technique gave a new space to develop their personal ways in the field of ceramics. This approach to 3D printing was seen by students as being more adaptable than first expected. In the workshop evaluation, those students with no experience in 3D printing, reflected on how fast one could adopt the technique.

left: **Fig. 2** A long distance between the coiled layers or high pressure on the clay extruder results in a softly curved layering with an ornamental effect.
Photo: Hilda Nilsson
top: **Fig. 3** A change in heights between the coiled layers while printing results in a dynamic change from softly curved layering to straight and controlled layering.
Photo: Tapio Yli-Viikari

3D printing as a tool in the future

Ceramics has a long history of producing vessels and other usable and functional objects with its traditional techniques. As a material and a practice, ceramics is easily understood by its traditional ways of making. Ceramics also has other dimensions. As a material, ceramics are so versatile that they can be used and developed for multiple different purposes. In our daily lives, ceramics have played a role, for example, as utensils, bathroom furniture and tiles in buildings. The less common understanding is how widely it has also been used within industry and other fields, such as in nuclear science, space crafts, dental medicine and biomedical solutions. Having an understanding of ceramic materials' wide range and potentials, in this article we have examined the studio practitioner's perspective on 3D printing.

As stated, 3D printing can be explored and modified in many different ways. Here we have been paying special attention to materiality and the potential of the material to unfold at the very moment of the 3D printing. We have named this latter approach *material driven 3D printing in clay*. We have shown how simple

top: **Fig. 4** 3D printing directly onto a freshly slip cast lid for a sugar bowl.
Photo: Tapio Yli-Viikari
right: **Fig. 5** A replaced 3D printed handle on a mass-produced cup by KAHLA Porcelain factory.
Photo: Tapio Yli-Viikari

shapes can be unfolded in numerous ways by different printer settings and by simple and playful interventions, thus letting the ceramic material ›have a say‹, adding a hands-on and one-off touch. We have argued how the ceramic craftsman can utilise a high level of tacit knowledge and haptic skills within this approach and express himself through and with the material. We argue this approach to be similar to the concept of crafting through an immediate interface to matter, an idea already discussed by Dormer[30], and seeing crafting and execution as a unity that is intuitive and humanistic, as already proposed by Bernard Leach[31]. In this sense, we consider *material driven 3D printing in clay* to be utilising 3D printing as a ceramic craft tool in its own right.

Furthermore, we have suggested how in the future 3D printing based on the concept of *material driven 3D printing in clay* can be utilised as a tool for the craftsman for combining industrially mass-produced ware with a one-off touch. This has been demonstrated by printing directly on freshly slip cast objects and has shown opportunities both for decorative purposes, modifications

30 **Dormer** (1994)
31 **Leach** (1940)
32 **Özgündogdu** (2015), p. 14
33 **Johnson** (2011)

and for replacing parts on mass-produced ware, such as spouts and lid handles, with printed but unique functional parts. 3D printing can, in that sense, have a great impact on the philosophy in design, production, and consumption[32] by changing the idea of the mass-produced ware into smaller series with a one-off touch as special orders or via the involvement of a client.

In the future, the process of 3D printing may be closer to the idea of just »as easy as pushing a button«[33], but in the hands of artists and designers, the future of 3D printing can be a lot more. Through developing the technique, artists and designers develop materials and the field they are contributing to. Acknowledging the material limits in the digital realm, it can give more freedom and new possibilities regarding thinking of the materials. New approaches to making offer new perspectives on future possibilities. Whether 3D printing as a technique has a great impact on the field of ceramics remains a question that is as yet not fully resolved. What is certain is that 3D printing calls for creativity and makers to push the limits and explore the future possibilities.

Flemming Tvede Hansen *is a graduate student from the Danish Design School 1990–95 specialized in ceramics and glass. His doctoral thesis was a practice-oriented study where he experimented with 3D printing in the context of ceramics. His current research is about how experiential knowledge of crafts rooted in ceramics can be utilized in the use of digital technologies. Flemming Tvede Hansen is currently working as an Associate Professor at The Royal Danish Academy of Fine Arts – Schools of Architecture, Design and Conservation, Copenhagen, Denmark.*

Priska Falin *is a doctoral candidate working at the Aalto University, School of Arts, Design and Architecture, Department of Design, Helsinki, Finland. As an artist-researcher, Falin conducts practice-led research that concentrates on ceramics and its processes. Her approach is directed from aesthetics and the act of making. In the Ceramics and its Dimensions project, Falin is working as a co-ordinator for Shaping the Future (Module 6) in Aalto University.*

Michael Moore **The Common Ground**

Fig 1 Flemming Tvede Hansen giving a 3D printing demonstration at the *Shaping the Future* workshop at KAHLA Porcelain factory 4.4.2016. Photo: Priska Falin

Collaboration is the key to success. That may sound very sweeping and glib, but it certainly seems to be crucial in the realm of Ceramics. And it is the key to survival, especially in the world of ceramic art, design and industry. How do we examine the current context and future directions of ceramics as an industry, art form, and community of knowledge? This is balanced with the need for and relevance of enshrining histories and material cultures that we care about in a socio-economic and commercial climate arguably driven by very different values to the artist, designer and craftsperson.

So is there anything or anywhere that is common ground? Not one side or the other but a space or place where all can flourish? ›All‹ being commerce, industry, design and culture? We may have found that in KAHLA in 2016 (Figure 1).

KAHLA was so many things: frenetic industrial energy, noise and production, factory staff mingling with eager and engaged students, occasional bewilderment between clusters of experience and language, a lot of pointing and nodding – the international language all centred around one common fluency:

how clay works. That small territory, regardless of nationality, levels of expertise, language or age, linked a cluster of people from four different international educational institutions in the KAHLA Porcelain factory.

How did this all begin? Collaboration between ceramic art and design and industry is well established. And that's the very point. It works. It has been proven over time by the artistic collaborations in Sevres in France, Rosenthal in Germany and Arabia in Finland. It has been proven to succeed, even in very small increments; it creates a common ground where diverse areas of expertise can all sit inside the boundary of the creative cluster that exists in real time during events like the KAHLA Symposium.

This may be considered quite a naïve viewpoint considering the waves of factory closures and staff cuts across Europe. However, the design process is always about invention and reinvention, and manufacturers of ceramics will always do this in their attempts to survive. It is also where art and industry will survive and even flourish. It is an ambition that is long established as a goal. It is described, for example, in a description of the Arabia ceramics collection of the Stedelijk Museum in Amsterdam:

... industrial design by the Arabia Factory was also exhibited, along with work by its experimental department, which was founded in 1932 by Kurt Ekholm, the firm's newly appointed artistic director. His aim in this being for art and industry to have a beneficial influence on each other, young artists, designers and craftsmen were enabled to experiment with the factory's glazes and clay with a high degree of freedom.[1]

In 2010, I began a research project examining collaboration between ceramic art and industry. This was funded by the Irish Craft Bursary through the Design and Crafts Council of Ireland. It became a 4-year project examining different models of partnership and public engagement in Germany, France, Ireland, Hungary and Finland. One of the key points that stood out was that these initiatives, which I propose we can clearly connect to the

1 **Fuchs, Rudi** (ed.) (1998). *Ceramics in the Stedelijk*. Stedljik: Stedljik Museum

KAHLA Symposium in 2016, are long established. For example, in the commissioning of the ›Design Report‹ in Ireland in 1961 and the Rosenthal collaborations in Germany beginning in 1968:

Philip Rosenthal saw the opportunity to help to revive the art of porcelain sculpturing which got a bad reputation by being trivialized. Internationally renowned artists like Lucio Fontana, Wilhelm Loth, Henry Moore, Guenter Ferdinand Ris were creating a cross section of the variety of the plastics with their reliefs in editions from 6 to 100, starting in 1968.[2]

In this short article, we may be exploring the ›future through collaboration and education‹ but it is also important to consider the context of this development over time. And these initiatives require implementation and support at the national and international level. Lamenting the then current status of Design in Ireland in the 1960s, the Irish Government implemented the Design in Ireland report by inviting 5 Scandinavian designers to Ireland to examine Design in key areas. Their brief was to develop an overall survey of Design in Ireland focussing on the one hand on design promotion and design education, and on the other hand on the establishment of an Institute for Visual Arts in Ireland. Their areas of focus were textile design and printing: linen, wool, woven textiles, poplin, Donegal Tweed, hand knitwear and carpets. Also involved were glass, ceramics, souvenirs, graphics, packaging, stamp design and coinage.

Ceramics did not fare well in the assessment of the Scandinavian visitors, who were keen to stress that the Scandinavian model of design development was not something they were insisting Ireland follow. However, the report was very clear in establishing proper and long term links between craft, design and industry in all areas of the craft sector, including ceramics:

Original thinking artists with a complete knowledge of production must be put to work – ceramicists who will select the clay, the glaze, the form of decoration. It is clear that without some radical change in design policy it will be impossible to produce anything but the commonplace.[3]

2 Rosenthal. Retrieved 14.7.2016 from: http://www.rosenthal.cn/index.php/fuseaction/elwin/elwinID/1564/elwinBG/ffffff/elwinOffset/10/elwinAlt/Rosenthal%20Limited%20Art%20Edition.htm

3 Frank, Kaj & Scandinavian Design Group (1962). *Design in Ireland: report.* Córas Tráchtála / The Irish Export Board

These are just two examples from many which evidence the importance of collaboration between art, design and industry in the craft and ceramic sector. An examination of the current status the craft industry in Ireland indicates a very different landscape in 2014 as defined by the Design and Crafts Council of Ireland:

According to the Design and Crafts Council of Ireland, the crafts sector is valued at € 498m, with € 373.5m of business in the domestic market and € 124.5m attributed to exports. They also estimate that € 131 was spent on average per person last year on crafts alone. With improving consumer sentiment and increased spending this year these numbers are set to increase.[4]

This describes a far healthier sector than those assessed by the Scandinavian designers 50 years earlier. To return to the Irish Craft Bursary research project which began in 2010, that research examined 4 methods of contemporary collaboration between ceramic art and industry and defined four models of public engagement and dissemination. These were: Production (The Rosenthal Model); Studio (The Arabia Model); Education and Outreach (The Limoges Model) and Placement (The Belleek Model).

This text has already examined the Rosenthal model of collaboration between artists and industry. The Artist in Residence model of the Arabia Factory in Helsinki is long established and highly regarded. The Musée National de La Porcelain in Limoges, France has a thorough and fascinating exhibition with a breakdown of the making and decorating processes of porcelain production. In Ulster University, we have a long established collaboration with the Belleek Porcelain Factory in Northern Ireland, with student placement and student access to Belleek clay.

So this is the landscape, the context, the common ground which the KAHLA Symposium now joins – a history of assessments of craft and design sectors, and of collaborative initiatives between art and industry with the artist long established in a role within industry. This may not be immediately apparent during a

4 **Irish Government** (2014). *The crafts sector: A growing industry.* Retrieved 14.7.2016 from: http://www.merrionstreet.ie/en/allaboutjobs/Features-Articles/The_crafts_sector_A_growing_industry.html

live event – which KAHLA certainly was. However, those moments of experimentation, discussion and discovery when opening a kiln door will all build into the future legacy of the project symposium.

So if KAHLA is the future how does it stand apart? How is it original and innovative in a territory of events, symposia, residencies and collaborative projects? It does all of these things because it brings together the future of the world of making ceramic art and design in a European context. The student focus of the module is its future when these students become the makers, educators, curators and consultants for the future of ceramics in Europe.

Master of Arts ***Michael Moore*** *is Reader in Fine and Applied Art at Ulster University. In addition, he is the leader of the Creative Ecologies Research Cluster. Dublin-born Moore works in Belfast, and is also a member of the International Academy of Ceramics and a Fellow of the UK Higher Education Academy.*

Jörg Petruschat **Good Vibrations?**
Some remarks on the resonance between human beings and objects

At international interior show *imm Cologne* in 2014, students from the University of Applied Sciences Saar presented experiments they had undertaken with what was then a brand-new ceramic 3D printer. The focus of the students' presentation was not, however, on their successful findings – for them, they were as uninteresting as industrial products that fall out of their moulds by the thousand. What fascinated the students were the errors made by this printing technology. They saw these flaws as a source of inspiration.

This interest in the accidental is diametrically opposed to the concerted efforts made in the engineering field in its design of 3D printing technologies; engineers and many product designers continue to strive for ever higher resolutions in the field of rapid prototyping. They are seeking to achieve as close a match as possible to the ideal geometry of CAD programs with their 3D printing results.

There is a real clash of fundamental world views in these two approaches to form – striving for precision and higher resolutions, on the one hand, and the challenge of the accidental or errors when creating form, on the other.

Striving for geometrical precision inevitably entails the notion of formal perfection – whatever those involved understand this to be; indeed, the virtual space of the computer appears to guarantee this perfection and support this ideal.

The challenge presented by the accidental, or by flaws, conversely plays on the richness of the material and the complexity of its manufacture, in surprising and unique ways. Whilst it is true that virtual or mental models are part of this process, such models function only as the starting point in the production of form, whereby material and tools interact with one another. The model does not act as a dimensionally stable framework for this interaction.

Striving for perfection in a form, the creation of which is preceded by a process of production, is reminiscent of the ideas of the ancient philosopher, Plato, who considered everything visible and tangible in the human world of reality to be

representations of ideal forms, that is, of ideals beyond earthly existence.

According to Plato's conception, such earthly representations could, however, only imperfectly approach these ideal forms. Since, as soon as an ideal took material form or functioned as the measure for material, the complex and often chance properties of the material used would spoil the purity and clarity of the ideal model itself.

For Plato, all that is material is a contamination of ideal form. There are parallels in the beliefs held by deists centuries later about the devil putting temptation in the way of believers to lure them from the narrow path, and, centuries later again, in Nietzschean thought, where, Dionysian ecstasy, in any form, however beautiful, was seen simply as a prison for vitality.

I

There is a long tradition in the history of ceramics of grappling with perfection. This history demonstrates that striving for perfection is not particular to Europe or even ancient culture, but is integral to the process of creating forms. In 2006, the South Korean ceramicist, Young-Jae Lee exhibited 1111 bowls with varying contours in the Rotunda at the Pinakothek der Moderne in Munich, impressively documenting this search for perfection[1].

About sixty years prior to Young-Jae Lee's exhibition, the Japanese ceramicist, Sōetsu Yanagi argued the case for the beauty of the irregular.

Sōetsu Yanagi began his plea with an observation: in the ceremonies held by Japanese tea masters, there were no perfect artefacts, despite the fact that Japanese potters were entirely capable of producing beautiful, perfect vessels. Instead, the tea masters would order their utensils from Korea, since there, vessels of a ›natural‹ beauty were produced. This naturalness did not, however, *»lie in either the perfect or the imperfect, but must lie in a realm where such distinctions have ceased to exist, where the imperfect is identified with the perfect«*.[2] This irregularity was not, however, intentionally created, such as in the production of Raku tea

1 **Baumstark, Reinhold** (ed.) (2006). *Young-Ja-Lee. 1111 Schalen.* Ostfilden: Hatje Cantz Verlag

2 **Yanagi, Sōetsu** (2013/1954). *The Beauty of Irregularity.* In Sōetsu Yanagi, The Unknown Craftsman. A Japanese Insight into Beauty. New York: Kodansha USA, pp. 60–61

cups, when the potter made the deliberate choice not to employ a potter's wheel or when he left a cup's surface in an uneven state. Instead it was an irregularity integral to the process of manufacture, in which the concept of perfection was not significant. Sōetsu Yanagi saw beauty in a state where irregularity coincided with regularity, *»irregular not in the sense of being opposed to the regular, but simply that when one does not consciously aim at either there is always a little something left unaccounted for.«* [3]

Sōetsu Yanagi wrote down these thoughts at a moment in history, when Japanese crafts were faced with the threat of marginalisation by industrial production, and even with complete annihilation. He was concerned that the quality of industrial production would not be able to match the high attainments of the crafts, which would be detrimental to Japanese culture. He notes, *»The precise and perfect carries no overtones, admits no freedom; the perfect is static and regulated, cold and hard. We in our own human imperfections are repelled by the perfect, since everything is apparent from the start and there is no suggestion of the infinite.«*[4]

My question is, is the perfect *»cold and hard«,* because the confrontation with the material here has come to rest, has been extinguished or completely resolved? Is imperfection beautiful because the coming into being of form is discernible in it, process being visible in its traces within the material substance and in its flaws?

These questions point to a deeper reason. The relationship that we have to things is not merely determined by those things, but also by us as well. However, perfection, in the form supposedly achieved, and then displayed, distances itself from the imperfection in anyone encounting it. The concept of perfection testifies to an arrival, an end to struggle, to its validity, whilst the concept of imperfection lays stress on a process that is still open, on incompletion, on irresolution. Sōetsu Yanagi termed it the ›infinite‹, since, human inadequacy cannot be foreseen when one creates form. I think we should not ascribe form as a fixed characteristic of artefacts, as we so easily do. Form is that which

3 ibid., 121
4 ibid., 120

is developed, recognised and realised in our interaction with objects. Form is a term relating to the potential engendered between those involved in their making and things themselves.

II

Unlike Sōetsu Yanagi, today we know that industrial capitalist production really has contributed considerably to the demise and loss of craft skills, and has largely driven formal craft characteristics from everyday life. It is worth noting within this context that designers, above all, who work for industry and in large-scale production, have made the Platonic concept of the ideal their guiding principle – they want to manufacture their designs in a dimensionally stable manner, as uncompromisingly as possible vis-à-vis the production processes.

They have good reason for wishing to do so. When an industrial product has to be reproduced by the thousand, does its form not need to be particularly reliable, perfect even? Does it not need to be refined over the course of many studies like a naturally-occuring Darwian type, to demonstrate that it is fit for the struggle for existence? This was how Walter Gropius conceived his goal of good design in the early days, when designers first responded to the industrial era. After all, had consumers not earned the right to buy products in a form that would satisfy all their demands, that were particularly efficient, practical, in short, were *perfect?* Moreover, once conceived, should these designs not be vehemently defended against all encroachments by sales strategies impervious to aesthetic culture, against the expectations of engineers wedded to the narrow confines of their technologies, and against the cheapness of low-quality materials?

If young designers in particular now find perfection and regularity boring, and instead choose to take inspiration from imperfection, chance and surprise elements, does this herald a profound change in design paradigms? Or is the pleasure taken in challenging precision, or the delight found in the unforeseen, nothing more than a repeatedly articulated resentment felt when

faced with large industrial concerns and the power they hold to engender conformity even by means of calculated variety? How sustainable for the future is the Platonic concept of form, so appropriate to industry, and perfected by CAD programs, for design as a whole, and in cultural terms for our societies? I am also interested in what we see, what we feel when we take a particular object in our hands, when we use it and interact with it. Are the use parameters, our multi-sensual experience of handling of the objects, the pleasure we take when they function seamlessly, the sole criteria for the processes associated with these finished wares? Or is what happens during their production, and the imperfection which we embody, of significance?

III

The objects that we design and manufacture mediate our behaviour. They do this in two ways. They pre-determine space for our behaviour, as we use, experience, and take pleasure in them. A chair facilitates all the postures that we make when sitting in it; a vessel all the gestures we use to hold it in our hands. However, it goes beyond this. In their forms, objects also give expression to the energetic and material resources that we have to exploit to produce them.

These two dimensions of use and production intersect with one another in the form of objects. The behavourial space opened up by the artefact is merged with the manner in which the resources we need to use to produce and finish the object are exploited.

However, there is a further element at play here. When we use, experience and enjoy objects, our actions develop behavioural patterns that are doubly determined in their turn. *On the one hand,* they are determined by the formal qualities of objects, whereby the handling of resources via the design and a spectrum of behavioural options is established, stimulating us to use the objects in question.

James J. Gibson[5] developed the term ›affordances‹ for the behavioural stimuli engendered by objects.

5 **Gibson, James J.** (1979). *The Ecological Approach to Visual Perception.* Boston: Houghton Mifflin Company

On the other hand, the behavioural patterns that we develop with, and as a result of, things, are determined by our own habits and expectations, which we recall as soon as we are faced with the objects concerned. Objects do not function as instruction manuals that have to be followed slavishly by their users. The possibilities for use given form in an object have to be realised by means of the energy and experiences of its users. It is thus also true that in using an object, there is an intersection at play between the opportunities it offers and the willingness of the user to exploit or reject them. In our relationships with objects, we adjust our habits and expectations to the ›affordances‹, which we recognise in those objects. If we are attuned to the form we perceive the object to have, it will excite us and foster our behaviour. If the objects seem ›cold‹ to us, then we will remain indifferent to them or reject them.

Since our involvement with objects takes places over time, our behaviour develops procedural patterns. We interact with objects by ›dancing‹ with them in our own completely individual manner. We develop and discover the characteristics of our own personalities in them; and because we do not use, assimilate, move, apply, or turn off objects just once, but numerous times, a rhythm and variants in our behavioural patterns are engendered as a result of our repetitions.

Thus three procedural patterns intersect as we use objects: the patterns of production; the patterns of use, which are engendered by the form of the objects concerned; and the habit and expectation patterns, with which we bring to life these objects, mute as they otherwise are, by means of our relationships with them. Based on the interaction of these three forms of procedural pattern, our relationship with things can be described in terms of resonance.

IV

The term, ›resonance‹ may seem at first glance, when applied to the relationship between objects and people, to be no more than a metaphor. Let us investigate this, and consider the depth of the effect.

We humans are rhythmical beings: we have heart rhythms, brain waves, breathing rates, the pendulum-like effect of our arms as we walk, the way our legs swing when we run and walk – all of these things are natural processes. Since the experiments undertaken by Ulrich Randoll at the University of Erlangen in the 1990s, we are now able to watch the rhythmic oscillation of our cells via video. We now know with scientific accuracy that our musculature is subject to a synchronisation rate of around 7 to 13 Hz. Ulrich Randoll[6] ascribes pains in our musculature to a desynchronization of the rhythm of our cells. He designed a machine that fed mechano-magnetic oscillations deeply into our bodies, in order to reactivate derailed rhythmic biochemical and physical processes, and to regenerate and re-set them. Thus it is possible to say, that when we are healthy, we are properly resonant.

We share oscillations of this kind with all other organisms. They span from quantum physical effects on a sub-molecular level to swinging and circulational movements in the macroscopic arena: the swaying of leaves on a branch, the flapping of a bird's wings in flight, the blinking of our eyelids, the rhythm with which our body produces and releases hormones throughout the day. In a composition of 1982, entitled *Walking and Falling,* Laurie Anderson refers to the interconnection of our physical movement and our psychic disposition, *»With each step you fall forward slightly. And then catch yourself from falling. Over and over … and this is how you can be walking and falling at the same time.«* [7]

It is worth noting in this context that the earth's magnetic field oscillates at around 10 Hz[8]. Winfried Otto Schuhmann[9] discovered electromagnetic waves in the atmospheric layer between the earth's surface and the ionosphere, which oscillate without attenuation at around 10 to 11 Hz and with attenuation at around 7 Hz – on the night side they are rather differently modulated than on the day side. The mathematician and internationally famous complexity researcher, Steven Strogatz, who is based at Cornell University, Ithaca, USA, is even of the opinion that there is a tendency within the universe towards synchronisation,

6 Randoll, Ulrich G. (2012). *Das Matrix-Konzept. Medizin des 21. Jahrhunderts. Die Grundlagen der Matrix-Rhythmus-Therapie,* Verlag Systemische Medizin

7 Anderson, Laurie (1982), *Walking and Falling* from the album Big Science, Warner Bros. Records, track 4

8 see e.g. **Köhler, Reinhard Köhler (1935).** *Dispersion und Resonanzerscheinungen im Baugrund.* Zeitschrift für technische Physik, vol. 12, 1935, pp. 597–600, as cited in Randoll 2012

Angenheister, Gustav Heinrich (1936). *Bodenschwingungen.* In Friedrich Hund & Ferdinand Trendelenburg (eds), Ergebnisse der exakten Naturwissenschaften, vol. 15, Springer Berlin 1936, as cited in Randoll 2012

9 Schumann, Winfried Otto (1959). *Über elektrische Eigenschwingungen des Hohlraums Erde-Luft-Ionosphäre, erregt durch Blitzentladungen.* Zeitschrift für angewandte Physik einschließlich Nukleonik, vol. 9, no. 8, 1959, as cited in Randoll 2012

»At the heart of the universe is a steady, insistent beat: the sound of cycles in sync. It pervades nature at every scale from the nucleus to the cosmos.«[10]

Repetitions are operative in all of these processes: backwards and forwards, up and down, rising and subsiding, on and off, increase and reduction.

V

I would like to especially highlight three resonant phenomena within human behaviour. Firstly, any individual who repeats a process rhythmically will experience the effects of self-excitation and strengthening of the self. Here I reproduce the way in which the economist, Karl Bücher characterised this. In 1897, he was one of the first to systematically investigate such effects within the context of work and rhythm, recognising and describing their cultural and aesthetic significance:

When a maid scrubs the floor, the forwards and backwards motion of the scrubbing produces noises of varying strength. Similarly, the striking and swinging of a scythe when grass is being mown also produces sounds of varying intensity and length. Likewise, when the weaver's shuttle is thrust in and out, varying tones are produced by the varying strength of the worker's right and left hands, or his differing intentions, interspersed at regular intervals by the sound of the foot-treadle in operation. Even in cases of tasks that seem unlikely, such as winnowing crops or loading sand, a similar sound rhythm can be observed (the thrust of the shovel, the jettisoning and fall of grains of corn or sand). This aspect may be arbitrarily intensified. When attaching a barrel hoop with blows of a hammer of varying strengths, a cooper sounds a sort of melody, and the blows of a butcher's boy cleaver produce quite a drum march. Of course, the sound rhythm in all of these cases is not autonomous, but is contingent upon the rhythm of the task.[11]

More than fifty years later, the philosopher, Arnold Gehlen would develop the concept of the ›circle of action‹. At that time, the electronic oscillating circuit and its reinforcing effects were

10 Strogatz, Steven (2003). *Sync. How Order Emerges From Chaos In The Universe, Nature, And Daily Life*. New York: Hyperion Books, p. 1
11 Bücher, Karl (1919/1897). *Arbeit und Rhythmus*. Leipzig: Verlag von Emmanuel Reinicke, p. 27

well-recognised as elements of wireless telegraphy and electro-acoustics. Arnold Gehlen held that:

…in fact, in a number of quite central aspects of his own nature man himself is an automatism; he is heartbeat and breath, he lives in and by a number of meaningful, functioning, rhythmical automatisms – think of the motion of walking, think above all of the ways in which the hand operates. Think of the ›circle of action‹ which goes through object, eye, and hand, and which in returning to the object concludes itself and begins anew. The fascination exercised by the analogous processes of the external world bespeaks a ›resonance‹, which conveys to man an intimate feeling for his very nature, by focusing on what echoes his nature in the external world.«[12]

Arnold Gehlen used the term ›circle of action‹ to refer to self-oscillation, produced by the rhythmic interconnection of hands in action with observant eyes. In these cycles and repetitions, the body becomes resonant to itself. Simultaneously, however, this self-oscillation becomes an interpretative pattern for oscillatory phenomena in the surrounding space. Humankind, according to Gehlen, strives to compare itself with non-humankind, in order that, by means of this comparison and test of resonance, motivated by a fascination in its own rhythm and repetition and those of the other, the difference between it and the non-human will emerge.

When a human individual's self-oscillation searches for resonance in its surroundings, it is a function of cognition. It seeks identity and finds difference. It does not limit its focus, as I will show in what follows, merely to its relationship with so-called ›natural‹ processes, but also at least as significantly to how it relates to other individuals, and to things made by them.

Instruments and tools play the role of regulators or generators of rhythm in this seeking for identity and the fixing of a self via congruence and resonance. A drum prompts one to strike it, whilst the length of the drumsticks predetermines the spectrum of the frequency achievable. A piano encourages one ›to bash away on the keys‹, but it is the size of the keys and their

12 **Gehlen, Arnold** (1980/1957) *Man in the Age of Technology.* Translated by Patricia Lipscomb. New York: Columbia University Press. [Die Seele im technischen Zeitalter.], p. 15

mechanical coupling with the hammers via the strings that predetermine the field of action for the production of rhythm for fingers, hands and arms; and it is the construction of saws and planes that set limits to the speed of thrust backwards and forwards interchangeably that is achievable when using the tools. For a deeper understanding of the relationships that we develop and enjoy with man-made things, it is remarkably illuminating that the search for identity in the rhythm of a task is associated with saving energy. This saving comes about through the regularisation of a movement:

One observes knitting, mowing by hand, sowing, hay turning, cutting the corn with a scythe, the turning of the earth with a spade, the folding of a sheet of paper in a bookbinders, the setting of a composition in a printing house, or the counting of money by a cashier in a bank – everywhere one recognises uniformity of movement, the striving to break down complicated or protracted movements into simple or short sections, and the attempt to align energy used for the required action. Even when we write a series of identical letters or digits, we involuntarily fall into a rhythm with our movements, and our handwriting becomes ever more uniform. [13]

The »uniformity of movement«, Karl Bücher wrote, regulates »the expenditure of energy in the most economical way possible«.[14] In principle:

Rhythm arises from the organic nature of man. All of the natural exertions of the animal body seem to be regulated by it and to govern the need to expend the least possible energy. The trotting horse and the laden camel move as rhythmically as a mariner rowing or a blacksmith hammering. Rhythm awakes feelings of pleasure. Thus, it is not merely a means of simplifying work, but also a source of aesthetic pleasure, and is that element in art that for all people without exception, regardless of their cultural mode of behaviour, is inherent to sentiments felt. [15]

Even for the Ancient Greeks, it was rhythm that properly structured all relationships, allowing them to be pleasing due to their

13 **Bücher** (1919/1897), pp. 32–33
14 ibid., p. 33
15 ibid., p. 454

internal ordering. »Rhythm was a principle for them which penetrated the entire universe, being created coevally [...] with the ancient Orphic Eros, who ordered the primeval chaos and set in motion the *progress of the stars*«.[16]

The second type of phenomena, to which I would like to point, are resonances that occur within a community – in association with a communal task, in the rhythm of ritual and dance, but also in the course of reaching transcendental states as part of collective ecstatic acts. On the modulation of movement patterns, Karl Bücher again, »The best-known example [...] is threshing with a flail, whereby the correct rhythm is only achieved once three, four or even six workers cooperate.« He stated that, »The same process can be [...] observed [...] when two carpenters hew a tree trunk, or when two stone masons work alongside one another [...] or when two maids beat a carpet«.[17] He continued:

When working in a row of mowers standing in a meadow, all participants have to form their windrows evenly, so that they do not get in the way of either of their neighbouring workers and none of them need fear that he will be hit by a scythe. [...] This mutual modulation recalls other work that takes place noiselessly and is enacted by workers employing a rhythm in common with one another. It thus becomes an element of discipline of the greatest importance.[18]

In fact, such moments of intensification in human cooperation as part of communal events form a central, even constitutive element, an ordering factor, and institution of our coexistence. The French sociologist, Émile Durkheim has explained that the experience of communality in rhythm is the origin of religious experience. Based on numerous ethnological findings, Durkheim demonstrates that the rhythmical gestures of participants can mutually escalate to a point that those involved experience ecstatic feelings, in which the sensations of the individual take him beyond himself to an experience literally of supersensible energies. With a view to modern society, Durkheim writes that:

16 ibid., pp. 457–458
17 ibid., p. 29
18 ibid., p. 32

In the midst of an assembly animated by a common passion, we become susceptible to acts and sentiments of which we are incapable when reduced to our own forces; and when the assembly is dissolved and when, finding ourselves alone again, we fall back to our ordinary level, we are then able to measure the height to which we have been raised above ourselves.[19]

My question, in this present context, is does this mutual excitation also apply when it is mediated, not by means of air and light, but instead by tangible artefacts, the significance of which often lies precisely in their ability to increase the efficacy of an individual, and enhance his energy? Are objects not our companions, if they increase our powers and extend our opportunities, if they make our lives beautiful and pleasant, and if they make evident the striving of other people? Do we not vibrate and become excited, when we hold artefacts that others have made for us? Electroencephalographic measurements demonstrated that when guitarists play music together, their brainwaves become synchronous[20]. Even in the preparatory phase, when the musicians adjusted themselves to an agreed rhythm given by a metronome, similarities in their brainwave patterning started to increase. The scientists take the view that this kind of synchronisation generally precedes, and then accompanies, temporally coordinated activity between two people.

Questions and observations such as these lead on to a third resonance phenomenon, which I would like to designate here as fundamental to the relationship of humans and objects. It has to do with our ability to recall, on the basis of our own behaviour, the behavioural traits of other individuals, even when those people are not present or party to the current situation, in which we find ourselves. The neurophysiologist, Antonio Damasio, who became world famous with his research on embodied consciousness, describes the following episode:

One summer afternoon when I was at work in the lab, I had gotten up from my chair and was walking across my office when I suddenly thought of my colleague B. I had no particular reason to think of

19 Durkheim, Émile (1976/1915). *The Elementary Forms of the Religious Life*, translated by Joseph Ward Swain. London: George Allen & Unwin Ltd. [Les formes élémentaires de la vie religieuse.], pp. 209–210

20 Lindenberger, Ulman / Li, Shu-chen / Gruber, Walter / Müller, Victor (2009). *Brain swinging in concert: cortical phase synchronization while playing guitar.* BMC Neuroscience. http://bmcneurosci.biomedcentral.com/articles/10.1186/1471-2202-10-22 (accessed 1 July 2016)

him – I had not seen him recently, I did not need to talk to him, I had not read about him, I had no plans whatsoever to see him – and yet there he was present in my mind, the full recipient of my attention. One thinks of other people all the time, but this was different, because the presence was unexpected and demanded an explanation. Why was I thinking of Dr. B now?

Almost instantly a rapid succession of images told me what I needed to know. I mentally replayed my movements and realized that I had moved, for just a couple of moments, in a manner that was that of my colleague B. It had to do with the way I swung the arms and arched the legs. Now that I discovered why I had been forced to think of him, I could picture his gait distinctly, in my mind's eye. But the fine point is that the visual images I had formed were prompted – better still, shaped – by the image of my own muscles and bones, adopting the distinctive motion patterns of my colleague B.[21]

This recalling of images, affects and feelings by means of our bodies can also be mediated via artefacts. When a musician plays a composition written by someone else, she is able to feel the mood of the composer. When we brush our teeth, we get a sense of the hand of the designer in the handle of the toothbrush. When we sit on a chair, we can intimate the posture of its maker.

Almost imperceptibly, we have returned to the hypothesis that resonance phenomena are produced when we have to do with objects, because behavioural traits are inscribed into the artefacts, are embodied by them. When we use and enjoy them, these behaviours are evoked. Nonetheless, it should have become much more evident that when humans give things a form, they do not stuff them full of messages that need to be decoded or read out of them, and turned into behaviours, such as might be the case with other kinds of information or commands given. If we see people as actors capable of vibrating, who consist of their own frequencies, and are animated and affected by the reciprocity of other people, then we gain another insight into the relationships between people, and between people and the objects that mediate those relationships. Objects no longer appear to

21 **Damasio, Antonio** (2010). *Self comes to Mind. Constructing the Concious Brain.* New York: Pantheon Books, p. 145

be mere conduits of consumption, or elicitations to consume, but instead as structures capable of creating resonance. We can recognise that it is the users of these objects, who by means of their own particular energies, are what make these structures resonate. The concept of resonance makes the relationship between humans and things appear more open and freer than the communication paradigm with its notions of transmitters and receivers would have it. There are People, whose behaviour flows into things, and other people who recall such behavioural patterns, when using objects into which these behaviours have flowed, allowing them to create vivid processes with them, using the patterns of their own personalities. With affects aroused in them by the energies of other people, given shape in the forms of these objects, they are then fostered in intensifying and supporting their self-perception.

VI

At the moment when the hand of the maker lifts away from an object, he or she last senses and feels the object. When a user touches the object for the first time, this is the first thing he senses when he touches it. This applies to all handmade creation of form, whereby the body comes into play in the use and enjoyment of it. It applies, too, to design prototyping.

Unlike design for industry, the craftsman has the artefact in his hands throughout the process of manufacture. Because until production is complete, the opportunity to vary the form is literally in his hands (even just because of a mood he is in on one particular day), the person who uses and enjoys it subsequently will not only recall the behavioural patterns related to the circumstances of its use, but she will also evoke with her hands the aesthetics associated with the making of the object. Thus the aesthetic experience enjoyed by the user is not bound up solely with comfort and ease of use. In experiencing the object by using it, a productive, creative aspect will also resonate. One sees this, for instance, in a loaf of bread. In tasting the ear of the wheat used to make it, one also tastes the harvest, the earth and

the climate in which it was grown. Things stop appearing simply to be about service and proclaiming their ease of use; users can also articulate their production by aesthetically experiencing them. Sōetsu Yanagi noted that true beauty stems not from the form emphasised by the maker, *»creation here means, rather, making a piece that will lead the viewer to draw beauty out of it for himself … beauty, that makes an artist of the viewer«*.[22]

This theme of developing, affirming and enriching one's own personality also lies at the heart of our search for resonance in objects of industrial origin. In fact, many industrial production processes are mechanised craft practices, divided into smaller stages, and as a result speeded up. However, we can recognise the fact that in the industrial production of many ceramic objects, the opportunity to experience form when using them has been divorced from the forms associated with their production. For a long time now, it has been the case that ceramic objects are no longer built up and turned by hand. Instead, ceramic masses are cast and pressed in moulds. Casting and pressing as processes have been particularly favourable for industrialisation and efficiency. As a result, tool forms were introduced into the production process, meaning that the handmade disappeared. Thus the search for resonance in the resultant objects could only at best expect to find surrogate and imitative versions of craftwork.

The nineteenth century saw many disputes, in which industrial imitations of craftwork were claimed to be fraudulent and were rejected. The response to these debates by many designers consisted of an aesthetic offensive, in which they emphasised and exposed the results of industrial processes as perfect *technical* forms. This seemed radical, but perhaps it was the radical nature of these technical actions, which celebrated consumerism and skirted over the realities of production and the resources that had to be exploited to make them.

The argument introduced into the debate in favour of an industrialisation of form centred around prosperity for all, via the efficiencies of mass production. However, as a result, precision, perfection and seamlessness as preferred formal characteristics

22 **Yanagi** (1972), p. 124

took the foreground, and any sense that manufacture was being done in the name of ever more luxury and the experience of that luxury was obscured and obliterated.

In the field of ceramic vessels, this obfuscation of manufacturing processes can especially be seen in a kind of buffing used as a separate production stage following the removal from the mould of the cast porcelain, or, following the pressing, that is, used as an integral function of industrial automation.

Many decorative designs and pictorial images, applied mechanically in ever faster processes, went some way to hide the manufacturing processes behind a layer of beauty, applied as a last step in the production, often in order to cast a veil over low quality materials and unskilled workers. The personality of the consumer, in its search for identity, would only find resonance in *these* forms in respect of ever more perfect consumption, and any seeking for congruence with the hand of the craftsman or with processes of making, in their searching for form, any reference to the imperfect in us or the incompleteness of reality would come to nothing.

Of course, form must relate to the use function of objects. I do not wish to dispute that. However, in times of excessive consumption, we must ask ourselves whether ›joy of use‹, an unconditional ease of application, should be where we set our sights for the future.

VII

Last year (2015), the Dutch ceramicist, Olivier van Herpt, initiated the project *Solid Vibration* in collaboration with Ricky van Broekhoven. As part of the project, they exposed a 3D printing process to deep frequencies emitted by a loudspeaker, which they had placed under the building platform. Olivier van Herpt[23] describes their intentions, »*A moment in time, a song, a sound, they can now become objects that encapsulate the moment forever. Vibrations turned into shapes by the 3D Printer.*« As a consequence of the process adopted in this project, forms were produced, in which the form of the printed ceramic skein oscillated rhythmically. It

23 **van Herpt, Olivier** (2015). *Project Solid Vibration*, http://oliviervanherpt.com/solid-vibrations/ (accessed 28 June 2016)

was not intended to be decorative, or an application as an afterthought onto an existing form; this oscillation of form penetrated the entire vessel wall.

Although Olivier van Herpt and Ricky van Broekhoven integrated the loudspeaker directly into the 3D printer, the sound coming from it was a formal factor applied from ›outside‹, disturbing the printing process itself, and, to some degree, working with its resilience. That places this project within a series of experiments, starting some years ago, which took delight in the errors and accidents of 3D ceramic printing, a series that achieved an impressive aesthetic result in Olivier van Herpt's ›adaptive manufacturing‹ projects. Nevertheless, in this testing of resilience and intervention in perfection, there is a grand ideological image at play, that is, disturbing technical processes in the name of an aesthetic experiencing of material and process.

Olivier van Herpt is one of the most experimental designers in the field of ceramic 3D printing at the moment. When he began experimenting with 3D printing in 2014, it was immediately clear to him that the uniqueness and individuality that we know characterised the origins of craftwork would be attainable again by means of this technology. However, his experiments with ›adaptive manufacturing‹ are no naïve return to the crafts. As was the case nearly one hundred years ago at the Bauhaus, his referencing of the crafts is not about reviving traditional stylistic forms. Then as now the connection with crafts did not have to do with producing things by hand, but rather to do with regaining control over design processes, which had been stripped away from designers over the course of industrialisation in favour of engineering and marketing. At the Bauhaus they still believed that industry was nothing more than mechanised craft, and that one could handle an industrial system in much the same way as a master craftsman would handle his stylus. Evidently at the time, they did not recognise the significance of the power of regulation and formal authority of large industrial systems, because mass consumption and prosperity seemed worth striving for in the face of so much need. Today we know that these

large-scale structures create alienation, and the uninhibited expansion of returns on investment limits our horizons for the future.

In fact, the manufacturing opportunities led by computer technology are returning control over design processes in a high degree to designers. This depends less and less on manual dexterity, and more to do on skilful coding, the courage to experiment with materials, and the construction of machines capable of producing new formal qualities in their material experimenting. One may regret the withdrawal of the handmade from the production of forms, but perhaps the separation of design from craft is less a divorce requiring therapy, and more a form of differentiation whose possibilities have yet to be fully exploited.

In a masters thesis I am currently supervising together with Barbara Schmidt, Babette Wiezorek goes beyond the challenge presented to 3D printing by signals ›coming from outside‹. She has developed ceramic design processes to replicate living systems, featuring feedback and self-learning design processes that continually culminate in ever-new processes of formal design. Although the handmade is no longer at play in such manufacturing processes, the forms that are produced vibrate with living patterns, even if their oscillations are the result of a technical arrangement.

In these and many other experiments, ceramic 3D printing escapes the cliché that it is not much more than a mechanical imitation of the ancient technique of coiling – without giving the impression that it offers perfect solutions. If it succeeds in keeping attention on form in its search for form and, in producing things, on its origins in the unfinished, its attempt to recognise something aesthetic in our reality, and in us, it will find resonance.

Incidentally: Olivier van Herpt and Ricky van Broekhoven set their loudspeaker under the 3D printer to a frequency spectrum between 2 and 8 Hz, which overlaps with the frequency band within which the earth oscillates.

Jörg Petruschat *studied aesthetics, cultural sciences, and the history of art, design and urbanism at Humboldt University Berlin, where he also obtained his doctoral degree in 1984. From 1998 onwards, he worked as a Professor for Theory of Culture and Civilization and also for History of Gestaltung at the Design Faculty, University of Applied Sciences in Dresden. Since 2014 he has worked as the Professor for Theory and History of Design at Weißensee Kunsthochschule Berlin. He is Chief Editor of* Form+Zweck, Zeitschrift für Gestaltung. *His current research interest lies around the topic of the coherence between design and growth, the ability to design, and its cognitive function.*

Part Ⅲ **Exhibition**

Riikka Latva-Somppi **Ceramics revisited**

The Shaping the Future exhibition objects were selected from two calls open to students of the participating universities and staff involved with the project. The themes given to guide the applicants in their proposals were: *Global Futures: Environment – Ecology – Economy, Societal changes, 3D printing – Old technologies revisited, and Food culture: impact on ceramic concepts.*

Many of the selected projects can be discussed under several topics. Some of the exhibition projects are presented in the workshop section of this publication as they are strongly linked to it. In the following section, student and university staff projects are shown side by side. In addition, selected artists and designers working in the field were also invited. In the last section of the publication they present their most recent applications of ceramics involving digital technology.

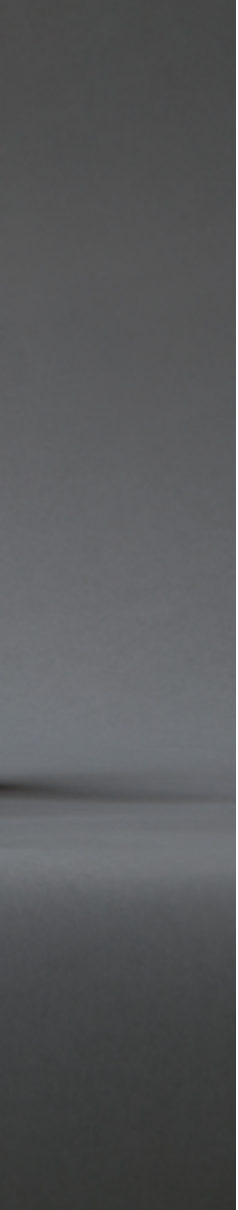
Clay is earth, available to everyone, everywhere, but has its local characteristics. As the world seems to grow smaller, locality has a specific role in people's lives. Some works in the exhibition discuss local identities through chosen materials, some form language and even sound. Workshop openings grow into well-designed projects, and objects themed by food cultures use new technologies in their production or to reflect societal changes. Old technologies meet the new as digital tools provide highly accurate decoration and structure to tableware or architectural tiles. Deep material knowledge can also be seen in digitally manufactured projects. The beauty of material randomness in ceramic processes can be seen in, for example, patterns in a thick glazing, but also in the rhythmical failure created by a 3D printer's inability to master the soft clay body.

The projects themed by new technologies show different ways of transforming information into form, utilising digital tools to master production, or simply seeking how the material aesthetics can be experienced in a digital manufacturing process. Function is the focus here, but we also need irrational thinking resulting in seemingly crazy and useless applications – in the end, these may develop into the most revolutionary innovations. As utopias become reality they provide space for new utopias.

Maarit Mäkelä, FIN: Earth-dialogue

The *Earth-dialogue* installation is based on the creative process that Maarit Mäkelä followed in New Zealand in 2015. The core of her artistic practice is the local, natural environment and, in particular, the earth samples that she gathered during her walks in New Zealand, including sand, stones and clay. These materials were processed further in her studio and then used as a clay body for the works, and as coloured slips for the paintings she produced on the raw clay. The paintings were fired in ceramics at 1080 degrees Celsius. In this exhibition, one of the paintings is shown as part of the installation.

Earth-dialogue, 2015, Installation from earth samples, test pieces and clay painting



Colors Found in Nature, 2016, Ø 7.5 cm, height 12 cm, Installation, casting and colouring, gathering materials and creating recipes

Johanne Jahncke, DK: Colors Found in Nature

The installation consists of porcelain flasks coloured with different clays and earth materials found all over Europe. The decorative nuances show a geographical diversity in the natural world that surrounds us. The nuances vary, depending on the specific minerals the local materials contain, and the variations tell a story about their origin. The colour pallet manifests the richness of nature and is produced without unhealthy chemistry.

Dawei Yang, GER: Die Ästhetik der additiven Fertigungsformen

In the experimental design project *Bewegungsform / Porzellan,* Dawei Yang sought to redefine the production process of porcelain with the revolutionary technology of 3D printing. With a self-made paste extruder, he managed to transform the material into linear shapes and to pile them up on the platform according to the pre-programmed movement of the print head. The result of the experiment was ceramic pieces with various textures. Due to the semi-transparent quality of the material (porcelain clay), it is possible to bring forth a peculiar aesthetic through the play of light after burning.

Die Ästhetik der additiven Fertigungsformen, 2015–2016, Installation, 3D printing, porcelain

Hilda Nilsson, DK: Hilbert Curve

The Hilbert Curve collection consists of seven individual test prints with the computer-generated infill pattern Hilbert Curve. The project is an initial material research to test how complex patterns it is possible to print with different materials. The work is a combination of a repetition of the strict machine-made pattern and that of a live material – a »perfect« computer generated file and the material's own will.

Hilbert Curve, 2016, Ø 10 cm, heights vary
6.5 / 7 / 7.5 / 7.8 / 7.9 / 8 cm, Slip-casting and
3D-printing, red earthenware

Hilda Nilsson, DK: Clusters

The bowls are an exploration of the clay's continuous extrusion by the 3D-printer and of the cluster shapes that evolve from the technique. The focus is on the balance between the controlled and uncontrolled, the strictly printed lines on the edge and the uncontrolled free-flowing materiality of the clay. The bowls are examples of the variety which arises from the same print file by controlling how many layers are printed.

Clusters, 2016, Ø 7 cm, heights 2.5–4 cm, 3D printing, red earthenware, black earthenware, porcelain slip from KAHLA Porzellan factory, jiggered porcelain from KAHLA Porzellan factory, Limoges porcelain and Limoges porcelain with added frit

Storytellers, 2016, Three vases, each 20 cm in height, 3D-printed clay, milled hazel wood, sandblasting, gold patterning, painting by using conductive materials, glazed ceramics, wood, porcelain

Anna Schäffner, GER: Storytellers

Used for creating ritualistic or functional objects, ceramics show traces of every civilization, their customs, and their stories. The project *Storytellers* tries to link tradition and new technology and to bring a new contemporary perspective to the classical ceramic material, inviting the user to reconsider the craft of ceramics and to connect new technologies with a cultural tradition. The idea is carried out by the creation of three pieces, each inspired by an important culture in the history of ceramics: the Chinese, African and Arab culture. By connecting the patterns to a computer programming and touching them, the objects will emit a sound taken from the culture they represent.

Flemming Tvede Hansen, Martin Tamke, Henrik Leander Evers and Esben Clausen Nørgaard, DK: Filigree-Robotics-Star

The Filigree-Robotics project experiments with a combination of handcrafting and 3D-printing technology in porcelain. A handcrafted mould works as an input for 3D-laser scanning. A generative algorithm analyses the topology of the mould, identifies high and low points and uses these as a starting point for the ornamentation of a toolpath which follows the movements of the surface while 3D-printing in porcelain. The project investigates the possibilities of the technique within architecture and product design. The Filigree-Robotics project is a collaboration between the research center SuperFormLab and Centre for Information Technology and Architecture (CITA) at The Royal Danish Academy of Fine Arts.

Filigree-Star, 2016, 30 × 30 × 7 cm, Hand building, 3D-scanning, 3D-printing, porcelain and gold lustre

Monica Romagnoli, FIN: Amphora

Since Plato, the duality between the virtual and the real, between imaginary and physical worlds, has been a topic of discussion: the utopia of the first against the imperfection of the latter. The dichotomy of these two entities has not allowed a dialogue until recently. Today, thanks to new technologies, we are able to transform information from one reality to another, thus creating a bridge that goes from real to virtual and then to real again. Technological revolution has broken into the ceramic world with 3D-printing, reshaping our understanding of the material and its process. The inspiration of the work is from the ancient Greek vases in which painting and decorations have been used to tell a contemporary story. The bas-relief figures, performing everyday modern activities, have been first 3D-scanned and then 3D-printed in order to create plaster moulds for slip-casting.

Amphora, 2016, Ø 25cm, height 40 cm
3D-scanning, 3D-printing, ceramic casting
and bas-relief technique, terracotta

Churchill Reloaded, 2016, Cup: 9 × 9 × 7.5 cm, Saucer: 14 × 14 × 1.5 cm Lids: from 9 × 9 × 3 cm to 9 × 9 × 16 cm, Cut: 9 × 9 × 0.5 cm, Cast porcelain, laser-cut cerafoil, glaze slip, wood

Björn Bernt, GER: Churchill Reloaded

The project was started at the KAHLA workshop and has since been developed further. As a result, the patterns of the two-dimensional saucer/cup vector files were transferred into three-dimensional nurbs-models and then physically created via CNC milling. The CNC milled plaster moulds were then used to cast saucers, cups and vases. They are complemented by the addition of wrapped-around laser-cut cerafoil instalments and also by laser cut cerafoil lids and spoons. The shapes result from explorations of patterns found in church architecture.

Carolin Wachter, GER: Shaping errors

The works were created by collecting selected imperfect pressure-cast trays at the KAHLA factory and returning them to the process of production until they received the golden decor that they were supposed to have received had they had been produced perfectly. Rejects from the isostatical dust press, round plates with large cracks and unpolished rims were glazed and fired like top-quality goods.

Shaping errors, 2016, Casting, deforming during the process, porcelain, transparent glaze and gold décor, 20 × 8 cm

Yaara Rabinovitch, DK: Feeding the machine

The project is the outcome of interfering in the factory's standardised mass production, adding another layer to the subtle and often-overlooked interactions we have with everyday tableware. The objects are a result of »feeding« the Jiggering machine with different sorts of breakfast food and other leftover materials.

Feeding the machine, 2016, Ø 16.5 cm, height 6 cm, Jiggered porcelain

The EXEX extruded extensions / Coordinated randomness, 2016, 3D-printing on prefabricated objects, porcelain, coloured porcelain slip
6 plates, each Ø 13–15 cm

Babette Wiezorek, GER: The EXEX extruded extensions / Coordinated randomness

The EXEX project examines the relationship between prefabricated objects and 3D-printed extensions. A selection of precast items from the daily porcelain production in KAHLA were chosen to be modified and transformed.

Coordinated randomness was an experiment with the 3D-printing technique. A unique pattern was created every time, and the fragmented appearance of the result challenges our perception as we try to reconstruct the pattern's logic and find the link between the gaps. (See image in page 72–73)

Salla Luhtasela, Wesley Walters, FIN: Piippu Coffee Pot

Piippu is a pot that is equally suited for coffee or tea. Although it references a form typically associated with tea service, the removable filter holder makes it ideal for making delicious pour-over coffee, as well. Piippu is perfect for small-space living as it replaces bulky coffee paraphernalia with something small and aesthetically pleasing, being both functional and attractive as a sculptural, decorative element in the kitchen.

Piippu's form was inspired by abandoned industrial machinery in Helsinki that remains standing in the city despite having outlived its original purpose. Pipe joints, funnels, cylinders, rust and corroded metals all served as visual inspiration for both the shape and surface treatment. At present, it is made with a black slip finish with a tactile roughness that references old cast-iron cookware, as well as bluish-white colour when gas-fired.

Piippu Coffee Pot, 2015, Pot: height 10 cm, Ø 10 cm, capacity 340 ml. Filter holder: height 10 cm / Ø 11 cm. Solid cast porcelain with either black glaze and slip finish or gas-fired bluish white

Vesa Kattelus, FIN: Extensions

Extensions in techniques and tools
Extensions in tradition
Extensions in aesthetics
Extensions in way of thinking
Extensions in ideas
Extensions in possibilities

Extensions, 2016, Varied sizes, Slip-cast and 3D-printed porcelain. The slip-cast jug is a part of the KAHLA Porcelain factory's production. Extensions is an experimental exploration to combining traditional slip mould casting with contemporary clay 3D printing techniques

Tanguy Fraiture, GER: Unplugged Cool-Maker

The Unplugged Cool-Maker is a fridge working without electricity. Originally used in Africa, the cooling effect is produced solely by water evaporation in interaction with the ceramic material. In an outside environment, it can maintain a temperature between 10 °C and 15 °C which is optimal for, for example, vegetables and cheese. The product offers the user a smart and ecological way to conserve food.

Unplugged Cool-Maker, 2016, Height 38.5 cm, width 37 cm, Hand-formed ceramic in plaster moulds, external container: red clay, inside container: white clay with transparent glaze, wooden plates, cotton sheet


MJÖLK
MATO

Tuuli Saarelainen, FIN: BIS

Bis means *again* in Italian and it is the initial concept behind this tableware set, in which the size of each dish has been decreased to a minimum. Being absorbed in the moment and combining exciting flavours and textures on the limited surface of an ›unintentionally-small‹ plate during a dinner workshop in KAHLA led to the creation of a set of small dishes intended to add playfulness and a higher appreciation for food as an experience for others, too. By re-filling the minuscule plate, having a *bis*, the tableware set intends to arouse new discoveries, perhaps even to generate new traditions, while at the same time exploring the simple joy of dining.

BIS, 2016, 60 × 11 mm / 70 × 35 mm / 120 × 25 mm / 150 × 11 mm / 80 × 70 mm / 400 × 15 mm, Casting, wheel throwing, ceramic 3D-printing, glass blowing, CNC milling, porcelain, glass, cork, red clay


KARLA

Café Sommelier, 2012,
Espresso cup: height 5 cm, Ø 6,2 cm,
Espresso saucer: Ø 11,8 cm,
Coffee carafe: height 20 cm, Glazing,
processing by isostatic dust pressing,
jiggering/jollying, hand casting, pressure
casting, hard-paste porcelain

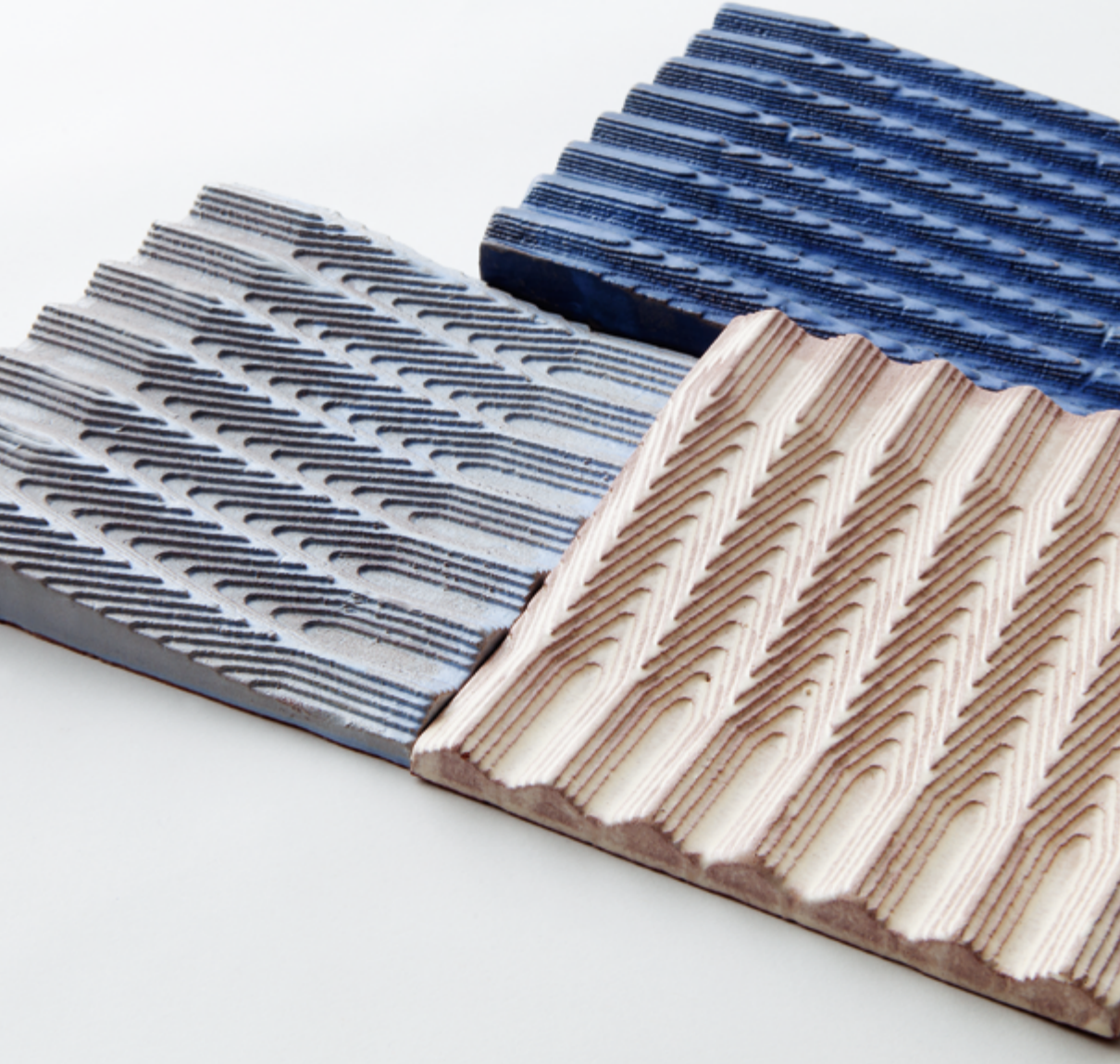
Barbara Schmidt, GER: Café Sommelier

When developing *Café Sommelier,* the questions were: How to design a cup so the coffee aroma can optimally unfold? What else besides the cup makes for the best coffee experience? Research on coffee was the basis to design the cups as tools for savouring it. Each cup has its very own character, depending on the beverage. All parameters such as size, wall thickness, rim design, inner shape, handles and the fit on the saucer were defined accordingly.

Michael Moore, NI: To Pour

Pouring is something we do every day. It can be deliberate and self-conscious, or just a random act. These pieces examine the activity of pouring in order to create objects with which food will be presented. The pieces study the relationship between clay and food surfaces, and any harmony or disharmony this examination creates.

To Pour, 2016, 100 × 200 × 10 mm, Hand built with poured slips and glazes, slab stoneware



Ornaments, 2016, 4 tiles 20 × 20 cm, 1 tile 20 cm × 30 cm, Glazed red clay. Mixture of glossy and matt glazes. Blue tones, metallic, pale yellow and white glaze with pearl lustre

Laura Kirk Sørensen, DK: Ornaments

Experiments with the technology of CNC milling have been used in the development of these ceramic tiles. CNC milling has been utilised as a tool for creating three dimensional surfaces. Through digitally-generated 3D-drawings, the CNC machine settings have been used as the shaping element. This approach examines the relationship between the shape of the 3D-drawn tiles and the roughing settings of the CNC milling in order to develop the tile reliefs. The project aims to rediscover the value of the ornament in ceramic tiles by suggesting another perspective on how to surround ourselves with colours, patterns and textures in a spatial context.

Elisabeth Hammann, GER: Leftovers

During the process of casting porcelain in the workshop many leftovers accrued and the piles of broken or failed castings and sprues grew and grew. The masses of casting remains developed their own aesthetics and after a while of only working with prepared moulds, one realises what potential lays in the randomness of leftovers, how liberating the chance is to create just in the moment with the pieces you have got by chance. These three necklaces belong to a leftover collection, developed during the KAHLA workshop. The porcelain pieces are garnished sprues, leftovers from casting big teapots.

Leftovers, 2016, Length 23–50 cm, porcelain parts 5–10 cm, Cast and garnished porcelain, glued together with textile-coated cable parts, porcelain and textile-coated cable

Simon v. Schmude, GER: Feyer

Feyer is a modular heating unit that redesigns the relation between humans and a heat source. It can be used as a central element within a living space and to make warmth sharable through portable ceramic disks. The flexible and comfortable concept of Feyer is capable of replacing the elaborate infrastructure of existing central heating systems by reviving the traditional way of heating with more targeted heat sources.

Feyer, 2016, Each disk Ø 32 cm, height 2.7 cm. Press moulded and glazed ceramic

Jin Zhang, GER: Flexible Mould for Porcelain Moulding Experiment

Aiming at a new way of porcelain moulding, this project rethinks the general rules of the plaster mould, turning it from a static to a dynamic element in the process. This is accomplished by composing the mould of small plaster elements attached to a polyester textile. The mould then becomes a flexible surface, capable of taking on all different kinds of shapes, which subsequently reappear in the porcelain material. As one of the applications, a mould can be formed by sewing different shapes into the flexible mould. Originally developed as a craft technique, it can also be thought of as a method for customizing industrial manufacturing.

Flexible Mould for Porcelain Moulding Experiment, 2016, Heights on average 18 cm, Moulded porcelain

Rhiannon Ewing-James, NI: MADE in KAHLA

The *MADE in KAHLA* series hopes to inspire a familiar tactile dining experience through the experimental combination of contrasting materials in tableware. The use of concrete and porcelain illustrates the importance of materials engrained in our everyday and historical European culture.

MADE in KAHLA 2016, Plates in varied sizes, Porcelain and concrete

Spirit of the place, 2016, 5 × 350 × 120 mm
Casting, 3D-printing and stamping on porcelain, glazes

Saija Halko, Hanna-Kaarina Heikkilä and Tuuli Saarelainen, FIN: Spirit of the place

Spirit of the place was born during the KAHLA workshop as a collaboration of three creatives. The project approaches the future of ceramics by looking closely at the potential of the locality. As a result, experimental art objects were created.

Priska Falin, FIN: Moving on – Leaving behind

Through ceramic objects, some of which may be more than 20 000 years old, we are able to gain information about past cultures that no longer exist. The material is so long lasting that it endures long after we are gone. This installation reminds us that what is left behind does not disappear, it remains there for the future.

Moving on – Leaving behind, 2016, Installation from broken porcelain pieces and a video projection

Invited Artists

CHIL-DISH, 2015–2016, 10 pieces with varying sizes, porcelain, cast using 3D-printed moulds
Photo credits: Kristos Mavrostomos

Anna van der Lei and Kristos Mavrostomos, FIN: CHILD-DISH

CHILD-DISH brings children, design, technology and food together. The project made its official kick-off in spring 2015 when kids were asked to draw »the world's greatest« tableware. The proposals ranged from a Batman plate to a cake-stealing device used by bandits. Finally, ten imaginative tableware designs were selected and modelled into 3D versions which were then printed in porcelain.


ARTEFACTS OF A NEW
HISTORY
UNFOLD
Edition
. . . / 30

Unfold, BE: Artefacts of a New History

The limited edition Artefacts of a New History (2016) is a collector box featuring nine different intricate ceramic 3D prints produced using Unfold's finest printing capabilities. The collection resembles a set of artefacts like those you might find in a natural history museum as superficially they look ancient, like fossils, but on closer inspection they reveal their strange technical nature. The project started in 2011 as a research project into the intrinsic qualities of the extrusion-based ceramic 3D printing process. Early on, it was observed that traditional thin-walled objects pose a challenge during printing, with objects collapsing under their own weight during printing. Resembling the idea of the buttresses used in gothic architecture, lighter and stronger structures can be created by integrating scaffolding into the design of the object itself. Instead of building objects out of thin and unstable walls, they can be printed using complex geometric structures.

Artefacts of a New History, 2011 and 2016
Collection box 42 x 21 x 6 cm and 3D-printed porcelain artefacts
Photo credits: Kristof Vrancken

Jonathan Keep, UK: Iceberg Field

Each structure is generated from computer code, and this work is about the beauty to be found in apparently random natural form. The algorithm used to generate these forms has an inbuilt randomness set within natural parameters, as with the formation of icebergs. The DIY studio-based 3D printing technique offers a timeless sense of layering, while the porcelain echoes the translucency of ice.

Iceberg Field, Iceberg Field, 2012–2015
3D-printed porcelain clay, heights 31–16 cm
Photo credits: Jonathan Keep

Charlie Stern, SE (project manager and initiator), Jonathan Keep, Design Studio Unfold: Boda Matrix – The Transaction Project

The Transaction project is a modular work that grows in stages, transacting with particular makers, institutions and techniques. The project began with the creation of a method to combine glass and ceramics via digital fabrication. It distributes the technique informally through a series of work sessions which invite glass makers to adapt and improve the process.

Boda Matrix – The Transaction Project,
2015, 3D printed ceramic and glassblowing,
180 mm × 110 mm × 110 mm
Photo credits: Viktor Sjodin









WASProject, Big Delta 3D printer for adobe houses, 3D printer, additive manufacturing, adobe and fluid-dense materials
Photo credits: WASProject

WASProject, IT

The goal of the WASProject is to build houses using local materials. For this kind of project, the 3D printer has to be transportable and have a low energy consumption. The Big Delta, a 12-metre-high printer, could be assembled in a short time and can use ›0 miles‹ materials, such as clay and short fibres.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weißensee
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European ceramics traditions and cultures are facing challenges, many of them in one way or another linked to the recent development of digital technology. This development is changing the rules of our everyday life as well as all aspects of trade.

This publication shares, shows and discusses the ideas and processes that have evolved during the project *Ceramics and its Dimensions* and the related module *Shaping the Future.* The module began with a workshop on the premises of the *KAHLA Porcelain factory* in Germany gathering together students, teachers and other stakeholders from the four partner universities with the aim of exploring the material of ceramics and the associated new technologies. These experiments resulted in diverse new ceramic pieces, yet even more important were the shared experiences and ideas that led to creative processes that continued after the workshop had finished.

The articles of the publication discuss the main issues of the workshop that were design, education, 3D printing and food. The publication includes also a catalogue of the works that are on display in a touring exhibition *Ceramics and its Dimensions: Shaping the Future.* The aim of the publication is to challenge, and perhaps even reposition, the role of ceramics and its future.

ISBN 978-952-60-7042-1 (printed)
ISBN 978-952-60-7041-4 (pdf)
ISSN-L 1799-4853
ISSN 1799-4853 (printed)
ISSN 1799-4861 (pdf)

Aalto University
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